NOV 19 1935

NOVEMBER 16, 1935

Railway Age

FOUNDED IN 1856

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Large Increase in Fall Traffic and Earnings Augur Improved Railway Situation in 1936

THE best single measure of total volume of production and commerce is the amount of freight shipped by railroad. Railway freight traffic this fall not only showed a much greater than normal seasonal increase, but reached the highest level since October 1931. That this indicates an increase in general business in 1936 over recent years is conceded in many quarters, and many railways are already giving attention to their equipment with the view of being prepared to handle a larger volume of traffic.

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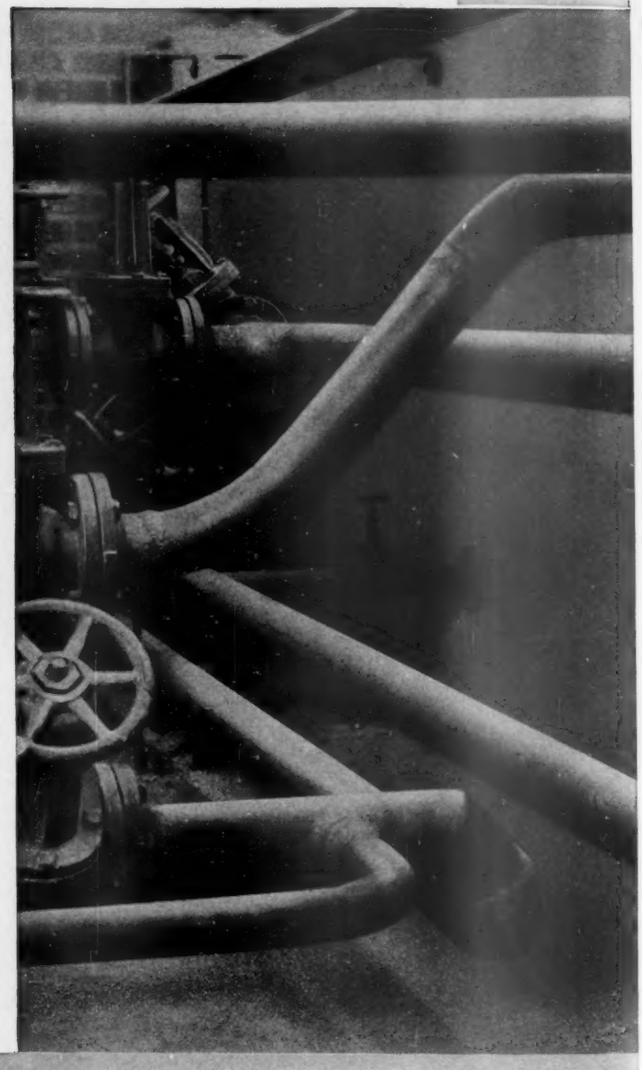

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Published weekly by Simmons-Boardman Publishing Company, 1309 Noble Street, Philadelphia, Pa. Entered as second class matter, January 4, 1933, at the Post Office at Philadelphia, Pa., under the Act of March 3, 1879.

Published every Saturday by the Simmons-Boardman Publishing Company, 1309 Noble Street, Philadelphia, Pa., with editorial and executive offices: 30 Church Street, New York, N. Y., and 105 West Adams Street, Chicago, Ill.

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832 National Press Building

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The Railway Age is a member of the Associated Business Papers (A. B. P.) and of the Audit Bureau of Circulations (A. B. C.).

Subscriptions, including 52 regular weekly issues, payable in advance and postage free; United States and possessions, 1 year $6.00, 2 years $10.00; Canada, including duty, 1 year $8.00, 2 years $14.00; foreign countries, 1 year $8.00, 2 years $14.00.

Single copies, 25 cents each.

Railway Age

With which are incorporated the Railway Review, the Railroad Gazette and the Railway Age-Gazette. Name registreed U. S. Patent Office.

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THESE BOLTS

TIE THE ENGINE TOGETHER

they must not loosen

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RAILWAY AGE

Meeting of Association of American Railroads

The meeting of the Association of American Railroads in Chicago last week was the most significant railroad convention ever held in this country. It was significant because of the recognition of the unprecedented crisis in which the railroad industry is involved, and because of the definite proposals made for dealing with the crisis, the frankness and energy with which they were discussed and the interest shown in the discussions. "Railroad industry" heretofore has been a rhetorical expression. As regards relations between the railroads themselves, there has been no such industry, but merely a large number of systems dominated by the habit and tradition of competition between themselves for individual success and glory. This habit and tradition were not unhealthy before, first, regulation, and, next, subsidized and unregulated outside competition, completely changed conditions and problems.

There was evidence last week that within the year since it was organized the officers of the Association of American Railroads, and some of its directors representing individual lines, have been more impressed than ever before that "railroad industry" should be made more than a rhetorical expression. The industry's problems are paramount to those of individual lines because they must be solved to make possible solution of those of individual lines.

It is possible to avoid general railroad bankruptcy. It is possible to avoid government ownership. But these ends are not practicable without adoption and execution, by an organized railroad industry, of means skillfully adapted to attaining them. The industry as a whole, not merely individual lines, is beset by both New Dealers and Old Dealers. As an industry, but not merely as individual lines, it can so present its case to the public as to make bad policies regarding it bad politics for both New Dealers and Old Dealers. As an industry, it can adopt policies itself, and secure the adoption of government policies, that will enable it to meet outside competition. As an industry, it can effect the operating economies practicable through railroad consolidations and co-ordination. Whatever the railroads may do by organized action to solve their problems as an industry, there will be plenty of opportunity left for what the Interstate Commerce Commission has called "healthy rivalry and striving" between individual lines.

Maneuvering for Government Ownership

One of the industry's great problems is that of public education. The danger of government ownership is great because almost everybody is promoting it—a few consciously, many more unconsciously. It is not merely a coincidence that Senator Wheeler of Montana, chairman of the Senate Committee on Interstate Commerce, is author of both the Senate resolution for an investigation of railroad financing and of the bill for government ownership, and that the Railway Labor Executives' Association has begun at this time an active campaign for government ownership. A third party convention in 1924 nominated the late Senator La Follette of Wisconsin for president and Senator Wheeler for vice-president. The convention was dominated by the railway labor leaders. Its platform advocating government ownership of railways was written by a committee the chairman of which was Donald R. Richberg, then general counsel of the railway labor unions. The "hook-up" is now, as it was then, plain enough.

We don't believe many railway employees now want government ownership. They were not consulted before the leaders of their unions renewed advocacy of it. We doubt if the railway labor leaders really want it. As experienced, skillful and ruthless politicians, what they want is whatever system, policy or policies will increase their own influence and their credit for using it. They assume that any real or apparent financial abuses their long-time friend and socialistic co-laborer, Senator Wheeler, uncovers will create sentiment against private ownership and management for profit. They anticipate this will at least help them in their campaign for legislation greatly to increase rail-

way labor costs regardless of the effect on railway security owners. If, as is the plain purpose of Senator Wheeler, it promotes the cause of government ownership and operation—well, the labor leaders hope that they would dominate government operation. Therefore, Senator Wheeler and the railway labor leaders can cordially work together in their own supposed interest as they did in 1924.

"D—the Torpedoes—Go Ahead!"

So much for those who are consciously promoting government ownership of railways. Their game is obvious. How about the many business men and other persons, both New Dealers and Old Dealers, who are opposed to government ownership, but are more or less unconsciously promoting it because they do not realize there is real danger of it or why there is? The salvation of private ownership of railways—the salvation of the entire system of political democracy and free private enterprise in this country—requires that the facts regarding the present railway situation, the causes of it and the necessary means of arresting the drift toward government ownership, shall be presented fully and courageously, at whatever necessary cost of money and labor, to the entire people of the United States.

There will be a howl of hypocritical criticism and anguish from Senator Wheeler, the labor leaders and their cohorts if this is done. "D—the torpedoes—go ahead!" said Admiral Farragut at Mobile Bay. The present danger to private ownership exists as much because of the past timid policies of the railways themselves as because of the aggressive policies of their enemies. The railways will soon have many more friends who will fight for them when they begin to fight for themselves.

We emphasize, in passing, one important point regarding any nation-wide propaganda effort, including advertising, that may be made for fair treatment of the railways and against government ownership. This is that the importance of the attitude and influence of the non-metropolitan press should not be underestimated. The outcome will be largely determined by the part of the press having the most real political influence and the least selfish reason for not discussing the railroad problem fairly. This is most decidedly the non-metropolitan press, because it is least under the influence of business interests antagonistic to the railways, and has the most influence in determining the nomination and election of senators and congressmen. Therefore, in any effective campaign of public education regarding the railroad problem, paramount consideration must be given to the non-metropolitan press throughout the country.

Meeting Highway Competition

There was forceful and constructive discussion and action at the meeting last week regarding some problems the railways must tackle in accordance with or regardless of government policies—especially competition with the trucks and co-ordination of their own facilities and service.

However useful truck regulation may prove, it will remain true that truck service has a great advantage over rail service as long as the trucks render pick-up and delivery service and the railways do not as generally render it. Therefore, it was voted to establish general railway pick-up and delivery service subject to such conditions and rates as the lines in different territories deem expedient. This will involve large expense. It is expected it will retrieve a large volume of gross earnings. The railways plainly have reached the point where they have to meet competition in service as well as rates or permanently give up a large and increasing amount of traffic.

The policy favored is an experiment—even a gamble. Its success will depend upon whether the additional gross earnings gained exceed the additional expense incurred. When in doubt, take the bold course is, however, a good principle. The only way to meet competition is to meet it; and we believe that the policy favored will in the long run increase railway net earnings.

Labor Legislation That Hinders Economies

It was agreed to co-ordinate lines and terminals wherever it is practicable thereby to make savings. In this connection there was discussion regarding the labor provisions of the Emergency Transportation Act. Investigation has demonstrated there are many places where substantial savings could be made by co-ordination excepting for these provisions, and their interpretation by Co-ordinator Eastman, requiring unchanged payment of the employees affected.

The constitutionality of these provisions is extremely doubtful. They put the railways in the paradoxical position of being required by law to effect co-ordinations to make economies, and of being forbidden by law to accomplish the economies by ceasing to pay the labor that would necessarily be displaced. The paradox is increased by the notorious fact that in every community both industrial traffic managers and labor are opposed to the co-ordinations that Mr. Eastman and his staff, and even some newspapers, business interests and economists, criticise the railways for not undertaking.

The *Railway Age* believes the railways have too long stayed in this anomalous position. It believes they should proceed with co-ordinations wherever they deem them practicable and worth while, in disregard of the labor provisions of the Emergency Transportation Act, and, if litigation results, carry to the Supreme Court of the United States the question of the constitutionality of these provisions. They do not maintain employment, their purported purpose. They merely require unneeded and unproductive employment at some places which takes money that could be spent for needed and productive employment at other places. They seem plainly unconstitutional, as an unwarranted interference with managerial functions

and as involving the taking of property without due process of law.

Are "Make-Work" Laws Constitutional?

The railways decided to contest the constitutionality of the "retirement acts" passed at the last session of Congress, which are a plain subterfuge for effecting in a different way exactly the same purposes as the pension act passed at the preceding session of Congress and which the Supreme Court invalidated. In principle, the labor provisions of the Emergency Transportation Act are worse than the retirement acts. Their plain purpose is to force the railways to employ labor they do not need for the purpose of "making work."

The railway labor leaders are constantly trying to secure legislation for this purpose on various pretenses. The labor provisions of the Emergency Act have the advantage, from a railroad standpoint, of being badly intended to "make work" and to accomplish nothing else—excepting, of course, to get votes for members of Congress who supported them. They seem, therefore, to afford an ideal opportunity for a court test of whether and to what extent Congress can cater to the labor unions by imposing restrictions and burdens upon the railways that disregard every principle of freedom and flexibility in private management of industry, of sound economics and of public right to reasonable economy in transportation.

The railroads are confronting a new era in which conditions contrast strikingly with those which existed in any previous era in their history. They are in greater danger of government ownership than ever before. Not realizing the danger, the public regards quiescently and complacently, and may continue thus to regard, the propaganda against the railways being, and soon to be, disseminated by Senator Wheeler, railway leaders and other advocates of government ownership.

More insidious and dangerous is the propaganda emanating from business interests supposed to be opposed to government ownership, but bent upon discrediting private management of railways and promoting unfair competition with them for their own selfish purposes. Government ownership is not unavoidable. Probably it will be prevented—but not merely by talking against government ownership per se. It can be prevented only by changing the conditions and policies that are pushing the railways toward it.

Time for Action on Interline Divisions

Quite aside from "co-ordination" of physical facilities, which Mr. Eastman is beginning to insist upon whether the law will permit any resulting economies or not, there is a costly phase of inter-railroad relationships that real railroad statesmanship could, and should, clear up speedily. We refer to the complexity and the controversy surrounding interline freight rate divisions.

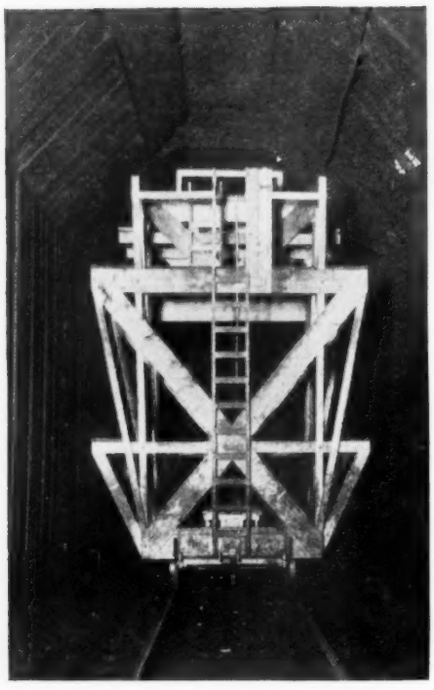
There are three cases before the Interstate Commerce Commission in which disputed divisions are involved, which have been dragging on for years. Divisions of revenues going back seven years are at issue in two of the cases and four years in the third. In these three cases alone the revenues of virtually all the railways in the country are involved and, until they are finally disposed of, no road can be certain just how its revenue account actually stands.

It is just a little inconsistent for competent railroad men who know their business to have to turn it over to civil servants outside the railway industry to attend to it for them. There is not the slightest hope, moreover, that a decision arrived at after mountainous statistical and legal labor will be any more just or more satisfactory than one which could be arrived at in a very short time by the informed judgment of competent railway officers, unassisted (and unconfused) by statistics.

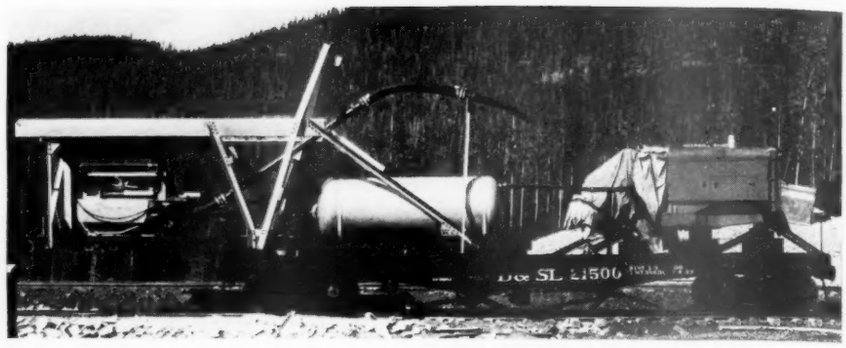
But the cases before the Interstate Commerce Commission are only a small part of the unbelievably complex mass of figures, formulas and controversial correspondence which constitute accounting for interline divisions. The Committee of Traffic Executives and Accounting Officers which has been working on this problem seems about to complete the job of setting up interim divisions which will be applied while agreement on divisions is being negotiated. But these interim divisions so far have not been made applicable to the three major division cases before the Commission.

Aside from the large accounting expense and the uncertainty as to the revenue position of any road as long as these interminable controversies are continued, the division disputes do an incalculable amount of harm in stirring up friction between railroads at a time when inter-railroad amity is sorely needed to meet the enemy without. Traffic and accounting officers ought to have more time to devote to ways and means of securing more revenue for the railroads instead of being compelled to put in time and energy in a needlessly complex dispute over the division among themselves of revenues already received.

Apparently the disposition of railway managements is generally favorable toward simplifying these divisions, and they should be easily persuaded to approve a procedure which would settle division disputes in a few weeks instead of a few years. The solution seems to await only a definite plan put forward boldly to crystallize a determination in the minds of those in authority to act now and for all time to put an end to this troublesome business.



Staging Cars Such as This Are Used by the Timber Preparation Gangs



More Than 30,000 Cu. Yd. of Concrete Has Been Placed with This "Gun"

Denver & Salt Lake Lines Moffat Tunnel With Concrete

Necessary adjustment of old timber lining and long haul impose many complex problems

SINCE June, 1933, the Denver & Salt Lake has been engaged in the placing of a concrete lining in the Moffat tunnel, which in many respects is one of the most difficult jobs of this kind that has been undertaken for a number of years. This project, which comprises the replacement of 16,577 ft. of timber lining, may be characterized as the last step in the completion of this 6.21-mile tunnel, since it was recognized when the bore was turned over to traffic on February 26, 1928, that the portion of the lining that was constructed of wood would require replacement or reconstruction within a few years.

The Moffat tunnel has had an extraordinary history. Its construction, long delayed because of the inability of the proponents of the project to interest private capital in their plan, was finally carried out by the Moffat Tunnel Improvement District (Moffat Tunnel Commission), a body created by the legislature of the State of Colorado, with power to levy taxes within the limits of a designated area of the state that was presumed to benefit from the construction of the tunnel. Work on the project was started in 1923 and after extraordinary difficulties, that led to expenditures far exceeding the original estimate as well as to disheartening delays, the tunnel was finally completed early in 1928. The Denver & Salt Lake, the only railway that has any access to the tunnel, entered into an agreement on January 6, 1926, to use and maintain the tunnel for 50 years, with the option to extend the agreement for an additional 49 years. The use of this crossing under James Peak was of marked advantage to the railway because it reduced the elevation of the crossing of the continental divide by 2,422 ft., shortened the railway 22.84 miles, and eliminated 31.76 miles of line, most of which was on a 4 per cent grade, on what at the time it was abandoned was the most difficult piece of railway to operate in the United States. However, it was not until the completion of the Dotsero cutoff in June, 1934, by the Denver & Salt Lake Western, a subsidiary of the Denver & Rio Grande Western, that the Moffat tunnel attained its intended status, that of an important physical element in a transcontinental railway route.

Wood Lining for 16,577 Ft.

At the time that the tunnel was taken over by the railway, 16,577 ft. was lined with wood, in 9,078 ft. the rock surface had been coated with gunite, and 5,400 ft. was unlined, while a length of 1,745 ft. had been lined with concrete. However, all but 2,637 ft. of the tunnel between the apex and the west portal was provided with concrete side drains or gutters. The concrete lining was confined to the two portals and to a stretch of 920 ft., about 2½ miles from the west portal, where the tunnel traverses the Ranch Creek fault. The lining here may better be described as an encasement from four to eight feet thick, with sets of heavy structural steel wall posts, arch segments and invert, since the rock encountered at the fault was so badly shattered that it was only with the greatest difficulty that the bore was successfully carried through, and then only by reason of the heavy lining provided.

Heavy ground was encountered elsewhere in the westerly half of the tunnel, with the result that much of the timber is of unusually heavy construction, in fact, evidence of excessive pressure on a part of the adjacent timber lining was responsible for a 65-ft. extension of the heavy steel and concrete lining by the railway in 1932. However, the need for a lining throughout most of the west half of the tunnel lay in the fact that the material encountered (disintegrated gneiss, feldspar and talc), while generally stable at the time of excavation, becomes soft to varying degrees when exposed to the damp and humid conditions prevailing in a considerable part of the tunnel. The material in the easterly part of the tunnel (porphyry granite) is hard and stable, and

such tendency as it has shown to weathering has been successfully resisted by coating it with gunite. Based on the experience with the gunited section completed by the commission, the railroad in 1930 applied the same treatment to the entire 5,400 ft. that had previously been left unlined.

Maintenance Cost Heavy

As had been anticipated, the timber lining soon became the primary source of concern. Although the tunnel is equipped with a ventilating fan with a capacity of 300,000 cu. ft. of air per minute, the temperature in the interior of the tunnel to within ½ mile of the east portal and to within 1½ miles of the west portal remains almost uniformly at 65 deg. F. the year round. With this optimum condition for the growth of fungi, the rate of decay of the timber, structural grade Douglas fir, has been extremely rapid. Maintenance work was required almost at once, and during 1932 it entailed an expenditure of $75,000, with every indication that the expense would be appreciably greater in subsequent years. As studies of the requirements and cost of a concrete lining indicated interest charges of only $48,000, the decision to authorize the concrete lining was an obvious one, especially as it was found possible to schedule the work of relining so as to take care of the worst places first and thus avoid any further expenditure for upkeep.

The New Lining

The new concrete lining provides a clear width of 16 ft., and a clear height of 22 ft. from top of rail to the crown of a semicircular arch. In general, the criterion for the design, namely, the reinforcement, minimum concrete thicknesses, etc., was the strength of the existing timber lining, which had demonstrated its capacity to carry the loads imposed. The design provided a minimum thickness of 6 in. for the walls and 12 in. at the crown inside any part of the old timber, and a minimum width between the timber sets of 18 in. It required also that the old lagging and packing be removed at intervals of 10 ft. along the tunnel so that the concrete would be in direct contact with the rock surface for a minimum width of 1½ ft. and a height of 5 ft. from the bottom, and for the same width and for distances of not less than 3 ft. below and above the spring line of the arch.

These requirements do not differ materially from those generally imposed, but they gave rise to some extraordinary problems in the Moffat tunnel because the 16,577 ft. of old timber lining embraced almost every type of timbering that has ever been employed in tunnel construction, including sets of 12-in. by 12-in. posts and arch segments at 5-ft. centers, sets of 12-in. by 18-in. timbers as close as they could be placed, and double sets, with 12-in. by 18-in., and 14-in. by 24-in. timbers placed outside of 12-in. by 12-in., and 12-in. by 18-in. timbers.

While the old lining was presumed to have been constructed to dimensions that would provide the required clearance for a future concrete lining, there were pronounced variations from these dimensions. For example, the clear width ranged from 15 ft. 6 in., to 21 ft. 6 in. and the clear height from 21 ft. 10 in., to 25 ft. 6 in. The posts were not all vertical, the arch sets were subject to all manner of deviations of position, and the lining was not in all cases symmetrical about the tunnel center line, with the result that it has been necessary to offset the center line of the track as much as 0.7 ft. from the tunnel center as constructed.

Preparation Work Extremely Heavy

As a result of these conditions, the work of preparing the old timber lining to receive the concrete has been far more difficult and required the employment of a much larger force than the construction of the new lining. This preparatory work ranges from a mere adzing of the posts and arch segments to the required clearance, to an almost complete removal of the old timbers. To insure safety in the latter case it is necessary to substitute steel sets constructed of two pieces of 80-lb. scrap rail, curved at one end to the outline of the arch and spliced at the crown. These are installed at a spacing of 12 to 24 in., and connected in pairs by means of bolts passing through

The Mixer Plant—Cement Tank and Aggregate Bins on the Right, Concrete Skip Hoist on the Left—This Plant Was Completely Enclosed for Winter Work

The Concrete Delivery (Hopper) Car, Spotted Under a 20-ft. Section of the Steel Lining Form

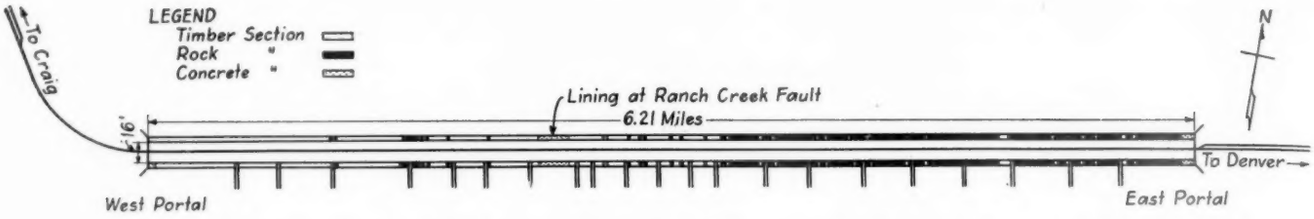


Diagram Showing the Nature and Extent of the Lining in the Tunnel When It Was Taken Over by the D. & S. L. in 1928

the webs at intervals of about four feet. Pipes cut to suitable lengths and placed over the bolts serve as spacers. The rails of the adjacent pairs are connected by means of bolts at about eight-foot intervals.

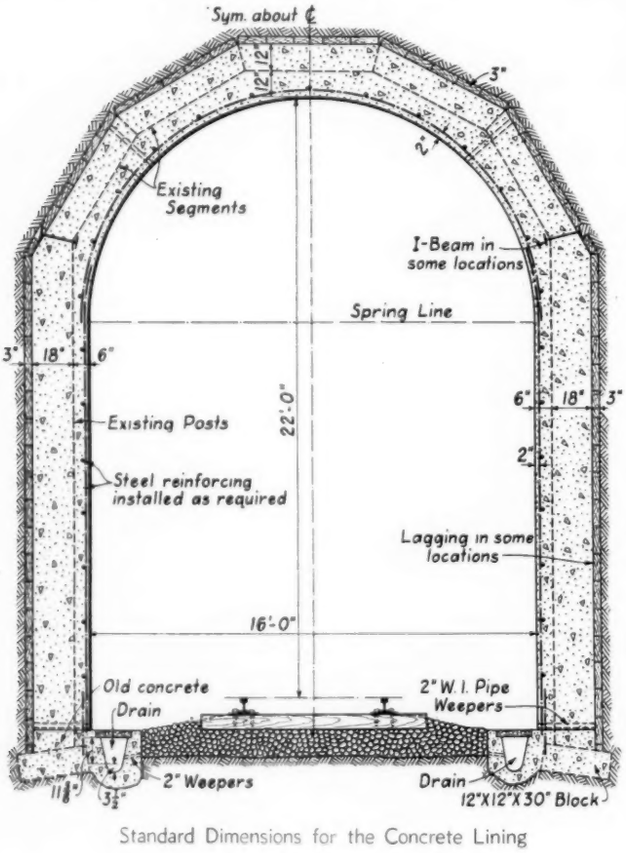
The timber preparation gangs conduct their work from staging mounted on power-operated cars, and are moved in and out of the tunnel in trains consisting of the following equipment:

1 motor car equipped with a Ford engine
2 push cars
1 reconstructed push car with a 4-ft. by 8-ft. platform
1 staging mounted on a Gardner-Denver self-propelled compressor car
1 staging mounted on a motor car equipped with a Ford engine

The air compressors are used to supply air for the operation of pneumatic wood augers with 2¼-in. bits that are used to cut out old timbers as well as to expedite the adzing. The air is used also to operate paving breakers employed in scaling loose rock and in scarifying the surfaces of old concrete footings to insure a good bond with the new concrete. The push cars are used to haul out timbers, packing and other debris, as it is necessary to keep the tunnel floor clear for the operation of trains.

The Concrete Work

Owing to the fact that over 80 per cent of the timber lining to be replaced was in the west half of the tunnel, the location of the concrete plant at the west portal insured the shortest haul from the plant to the forms. Investigation having shown the advantage of electric operation, a power line was carried over the continental divide from the east to the west portal to provide power and light at the mixing plant.



Standard Dimensions for the Concrete Lining

The plan also called for the use of Blaw-Knox steel forms, of which three sets each 40 ft. long were procured. They are removed, shifted and reset by means of pneumatic jacks mounted on a flat car. Removable doors along each side provide the openings through which the concrete is chuted into place from a hopper car. Angle irons attached to the ends of the forms, but set out so as to clear the end flanges of the forms by about three inches, provide a slot through which boards can be driven to form bulkheads. The forms are left in place 24 hours after the concrete has been placed, and can be removed and reset in about 30 min.

The concrete plant is designed for the gravity handling of the materials as well as the mixed concrete from the time that the aggregates and cement are delivered to overhead bins until the concrete has been chuted into a hopper car for delivery to the tunnel. Bulk cement is unloaded from box cars by means of a power and manually-operated scoop into a hopper that feeds a horizontal screw conveyor, and this in turn feeds a vertical screw conveyor which delivers the cement to a 550-bbl. steel storage bin. The fine and coarse aggregates are unloaded from cars by a locomotive crane with a clamshell bucket to an elevated storage bin directly over two one-yard Rex electrically-motored chain-driven mixers with automatic water control. The aggregates flow by gravity into a weigh batcher and thence through a two-way chute to either of the mixers. The cement flows from the storage bin through a Louvre-gate to a horizontal screw conveyor and thence to a cement weigher, whence it flows by gravity into the mixers.

The Concreting Cars

The mixers are discharged by a foot pedal into two one-yard skip hoist buckets that carry the concrete up an inclined plane into a steel-lined wood storage bin of 22 cu. yd. capacity, this bin being at a sufficient elevation to permit the concrete to flow through gates into the hoppers of a concrete delivery car spotted on a track beneath. This is a flat car provided with two hoppers, one with a capacity of 16 cu. yd. that is provided with chutes for depositing the concrete directly into the sidewall forms, and another hopper of 12 cu. yd. capacity at a somewhat higher elevation that is designed to deliver the concrete to a pneumatic gun. This is done in an ingenious manner. The gun is mounted on a separate car, but instead of being placed directly on the car floor, it is supported on a frame that is cantilevered beyond the end of the car that is next to the hopper car in such a manner that when the cars are coupled this cantilever frame telescopes inside of the frame on the hopper car a sufficient distance so that the charging hopper of the gun is directly under the discharge gate of the 12-yd. hopper.

The concrete delivery gun, which was furnished by

the Pressed and Welded Steel Products Company, Pittsburgh, Pa., is designed to deliver concrete at the rate of 40 cu. yd. per hour. It holds ¾ cu. yd. of concrete, while the hopper over it holds 5 cu. yd. Consequently, as soon as the gun has been charged the remaining 7 cu. yd. can be run into the charging hopper, thus permitting the delivery car to be uncoupled, either to return to the mixing plant for another load or to move into position for discharging the concrete from the other hopper into the sidewalls of another form. In addition to the pneumatic gun, a 39-ft. flexible delivery pipe and an elevated working platform, the gun car is equipped with an Ingersoll-Rand Diesel-driven air compressor with a displacement of 500 cu. ft. per minute, and an air receiver of 250 cu. ft. capacity.

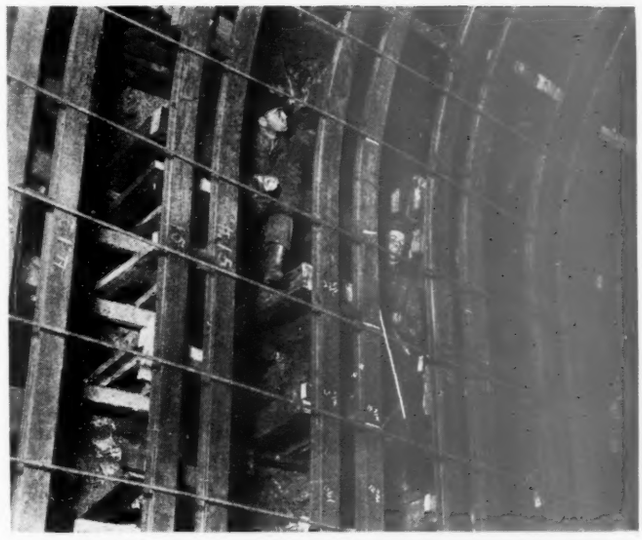
The concrete train is moved in and out of the tunnel by a steam locomotive that has been equipped with six additional locomotive-type air compressors, to insure an adequate supply of air for the operation of the jacks on the form-moving car. They also serve as standby compressor capacity that is available in the event of the failure of the compressor on the pneumatic gun car, and

Many of the Wall Posts Had to be Adzed to Insure an Adequate Thickness of Concrete

provide the power for an air motor that operates agitating paddles in the 12-yd. hopper on the concrete delivery car to prevent segregation on long hauls into the tunnel.

One incentive for the authorization of the work was that it would preclude the continued maintenance of the old timber lining, but to make this possible it was necessary to schedule the work so as to place the concrete first in those parts of the tunnel where the timber was in the poorest condition, and also to insure a rate of progress that would keep ahead of the rate at which the old lining was decaying. This required the continuation of the work during the winter months in spite of the low temperatures and heavy snow fall experienced. A temperature of 40 deg. below zero is not uncommon, and the season's snow fall ranges from 60 to 240 in. To meet these conditions it was necessary to house in the entire concrete plant, including a 240-ft. length of the track on which the aggregate cars are spotted for unloading. This car house was provided with a top consisting of hinged doors that can be opened when the clamshell bucket is in use.

To provide steam for heating the plant and for thawing frozen aggregate, the plant was equipped with a 125-hp. Scotch marine boiler. The aggregate is thawed by providing the cars with a pipe extending entirely around the inside of the walls at about mid-height, from which eight branches were extended downward to the floor where they were given a 90 deg. bend and terminated in open ends that serve as live steam jets. With this equipment cars of aggregate frozen solid can be thawed in three hours. Steam coils in the bins keep the aggregates at the desired temperature in the coldest weather. Mixing water stored in an old oil tank car is heated by direct steam.



Steel Rail Sets Installed Where Old Timber Lining Had to be Removed

The concrete is proportioned according to the water-cement ratio and test cylinders are made from the concrete for every 40-ft. section. The strength at 28 days ranges from 3,500 to 4,500 lb. per square inch. Tests of cylinders made when the aggregates and the water are being heated during cold weather have developed some pertinent facts concerning the accelerating effect of heating, a typical example being given in the table below:

	Concrete Heated to 90 deg.	Concrete Not Heated
Strength at 3 days	2,000 lb. to 2,600 lb.	1,700 lb. to 2,000 lb.
Strength at 7 days	2,600 lb. to 3,000 lb.	2,200 lb. to 2,400 lb.
Strength at 28 days	4,500 lb. to 5,000 lb.	3,500 lb. to 4,500 lb.

Concrete has been mixed at temperatures ranging from 75 deg. to 110 deg. F., although temperatures ap-

An Example of the Extraordinary Deviations in the Position of the Timber Lining

proaching the upper limit were attained in relatively few batches. The loss of temperature in delivery to the forms averages about two degrees; the maximum loss is about six degrees. Heating results in an acceleration of the setting, but this was of little consequence last winter because the concrete was being placed at points sufficiently close to the west portal so the time required for delivery was short; because of the greater length of haul that will be involved during the coming winter it will be necessary to avoid temperatures in excess of about 50 deg. F. Observations made last winter showed a considerable rise in the temperature of the concrete after it had been placed in the forms. Thus, concrete delivered to the hopper car at 75 deg. attained a temperature of 90 deg. in 24 hours, but by the end of 48 hours it was down to 80 deg., and at the end of 72 hours it had fallen to 63 deg.

Although temperatures well below freezing are experienced in the tunnel for a distance of about a mile from the west portal, large icicles forming on the old timber lining, freezing of the concrete was readily avoided by arranging to have the fan operated to blow air from east to west while the concrete was being placed and thereafter. The heat radiated by the locomotive of the concrete train was also an important factor.

Gang Organization

The force engaged in the lining operation is organized as follows:

Concrete plant—a foreman and 3 men operating the mixer, and an operator and a fireman on the locomotive crane

Outside labor gang—a foreman and 6 laborers unloading cement, maintaining tracks, loading out timber released from the old lining, cleaning up the yard, and making concrete covers for side drains from waste concrete

Concrete train—a foreman, 1 placer operator, 1 compressor operator and 10 helpers

Timber preparation gangs—two day and two night gangs, each consisting of a foreman and 15 men

Inside labor gang—engaged in excavating for the footings and in cleaning up—a foreman and 4 to 8 men

Bulkhead gang (bulkheading the ends of the forms and constructing the wooden forms for the refuges)—1 foreman and 8 men. This gang is employed only at night

The traffic moved through the Moffat tunnel daily embraces 2 Denver & Salt Lake and 2 Denver & Rio Grande Western passenger trains, and from 5 to 18 freight trains of both roads, and while this volume of traffic would not result in serious interference with work in a tunnel of ordinary length, it has resulted in pronounced delays to the work in this case, as may well be appreciated by the fact that the average time of occupancy of the tunnel block is 20 min. for passenger trains and 30 min. for freights. It is not surprising, therefore, that loss of time to the working force on account of traffic interference averages about 60 per cent, and that on some days it greatly exceeds that figure. Train movements are controlled by a positive manual block, and in the conduct of the work on the lining, neither the men nor the equipment are permitted in the tunnel unless they are given the block. The regular procedure is to give the block to the tunnel gangs for a specified length of time, and 15 min. before the time is up for the foremen to call up the operator by means of telephones permanently installed in the tunnel to ascertain if it is possible to have the time extended.

An Ingenious Expedient

The heavy loss of time to which the gangs were subjected led to the adoption of an ingenious working arrangement with the men. Thus the timber gangs are available for duty for a shift of 12 hours and are paid for 10 hours, unless the time actually worked exceeds 10 hours. The concrete gangs are employed on the same basis except that if the tunnel is available after the expiration of the 12-hour period, they may be required to work overtime at the pro rata rate, in which case they are paid for two hours less than the total time on duty, but not less than the hours actually employed.

In the face of variations in the daily train movements, it is not surprising that the amount of work accomplished per day would be subject to corresponding variations. Thus, the best month's performance was 1,309 lin. ft. of tunnel lining completed, and the smallest output was 600 ft. The best day's performance is 60 lin. ft. of lining. On October 1, a total of 15,140 ft. of new concrete tunnel lining had been completed, involving the placing of 59,433 cu. yd. of concrete. The average volume of concrete per foot of tunnel is 3.9 cu. yd., including the concrete in the footings and refuge chambers, and 3.82 cu. yd. exclusive of these items.

Salvaging the Timber

The tunnel lies within the limits of the Arapaho forest preserve, the regulations of which precluded the burning of any of the timber removed from the tunnel in the vicinity of the portals. As a consequence all the timber from the tunnel is loaded on cars and shipped to the railroad's terminal at Utah Junction (Denver). As about 25 per cent of the timber was found to be entirely sound, a contract was awarded to the operator of a portable mill to saw up the sound material into sizes that would have ready use on the railway. As a result of this operation the road has obtained to date some 6,000 crossties (6-in. by 8-in. by 8 ft., and 7-in. by 9-in. by 8 ft.), and 35 sets of No. 10 and 15 sets of No. 8 switch ties, in addition to a considerable quantity of 3-in. by 10-in. planks and other sizes aggregating 825,000 ft. b.m. All the cross and switch ties are moved to the nearby plant of the National Lumber & Creosoting Company for treatment, while slabs as well as other material of odd sizes are sold.

This tunnel lining project is under the supervision of W. C. Jones, chief engineer of the Denver & Salt Lake, who developed the plan and the equipment and is in charge of the work, which is being done by company forces. Theodore Keen is general foreman, and John G. Young is engineer inspector.

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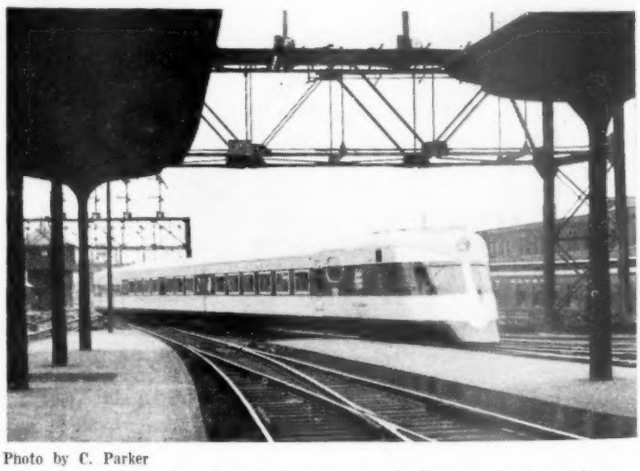


Photo by C. Parker

The New Haven's "Comet" Leaving South Station, Boston, Mass.

Eastman Urges Labor-Saving Economies

Warns employees there will be fewer jobs in future unless adjustments are accepted now

WASHINGTON, D. C.

ADVICE to railroad employees for their own good to accept instead of resisting the introduction by the railroads of labor saving plans, practices, and devices was the theme of an address by Joseph B. Eastman, federal co-ordinator of transportation, before the fifth annual conference on organization of the Brotherhood of Railway & Steamship Clerks at St. Louis, Mo., on November 9. Asserting that the test must be the greatest good of the greatest number, Mr. Eastman expressed his confidence that there will be more railroad jobs in the long run if labor-saving economies are accepted now and called on the employees to balance their immediate interest against their interest in the future and "accept some adjustments now for the value of things to come."

"If you do not," he said, "if you insist that two men must do work that could be safely and efficiently performed by one, you are helping to close the door against future increase in employment opportunities. And you should not be surprised if, as a result, more of you lose your jobs without compensation to bus, truck and air line employees than will be displaced with compensation by the plans for co-ordination that I favor."

Two days before Mr. Eastman had addressed the railroad executives at Chicago on the importance of co-ordination and in his address to the clerks he said his remarks would not apply to their particular group alone but to railroad employees generally. He said he was advocating consolidation and unification economies because, if the railroad industry is to go thrive and grow, it will be under the necessity, in order to meet its competition, of giving the best possible service at the lowest reasonable cost, and that "this means seizing every opportunity to save unnecessary expense." As one such opportunity Mr. Eastman suggested the possibility of two-man operation of light-weight equipment, whereas the railroad labor organizations are campaigning for "full-crew" laws, and said that so much employment has already been lost that railroad employees have nothing to lose and much to gain by co-operating to the limit in efforts to regain or create traffic.

There is not the slightest prospect, in his judgment, he said, that anything that may be done along the lines of regulating and restricting the railroads' competitors "will remove the need for the best possible service at the lowest reasonable cost, if railroad traffic is to thrive and grow." He also said that financial reorganization of the railroads that need it is not sufficient to bring about the necessary improvement in the railroad situation. Referring indirectly to the advocacy by the Railway Labor Executives' Association of government ownership and operation of the railroads, Mr. Eastman said the idea was "in no way shocking" to him but that, although it was possible that that may become necessary, he doubted "whether we shall come to that pass." Even if the federal government were the owner and operator of the railroads, he said, he would continue to urge the necessity for bringing their operating expenses down to the lowest reasonable minimum consistent with good and attractive service.

A condensation of the address follows:

The question which I shall discuss is a broad one, and it is not easy to state it concisely. I shall put it this way: Having in mind solely their own welfare, what is the wise policy for the employees to pursue with respect to the introduction by the railroads of labor-saving plans, practices, and devices? Please note that I do not include in this question the general public good or any other good except the good of the employees themselves. That is where your interest lies.

The question is one which it is difficult for the employees to consider in a perfectly cold-blooded way, because they have suffered greatly in the past few years and are still suffering. It is also a question which concerns the future as well as the present. I used to have a teacher who divided men into two classes, those who are long-headed and those who are not, the long-headed being the ones that walk off with the prizes in the end. We shall need all the length of head we have to find the right answer here.

I shall start my answer with the proposition that there is a connection between the welfare of employees and the prosperity of the industry. The opportunities for the employees are better when the industry is prosperous than when it is not. The employees may have to fight to get their deserts from a prosperous industry but at least the opportunity is there. On the other hand, you cannot get blood from a stone, and employees who work for a failing concern, or even for one which has difficulty in making both ends meet, have very little to look forward to.

The railroad business has been hit hard in recent years, and at present it is far from prosperous and neither is it growing. But unfortunately the depression has by no means been the only big factor in railroad troubles. You know better than I do what the automobile has done to railroad passenger traffic. And now the airplane is cutting in, more and more, on the long-distance travel. On the freight side we have the truck —and you know what that is doing—and also the water carriers, and the pipe lines, and the electric transmission lines.

Railroads Must Cut Costs to Meet Competition

A feature of this transportation competition, which has become so intense, is that to an extent hitherto unknown in the history of the country the big industries can furnish their own transportation, and they are doing it —by truck, by boat, and by pipe line. Even individuals can do it. The farmers are doing it with their produce, and millions of people are transporting themselves or their families from place to place. The railroads cannot hope to meet this competition unless they transport as conveniently and cheaply as industries and individuals can transport on their own account. Moreover, these other forms of transportation are not standing still but

improving every day, both in equipment and in methods. Do not imagine for a moment that the truck, for example, has by any means reached its maximum mechanical efficiency. So far as methods are concerned, a truck operator told me with pride the other day of the clerical labor he had been able to save by combining two hitherto independent trucking lines. There was no one to say him nay.

All this does not make the situation hopeless for the railroads. These new agencies are creating traffic and adding to the sum total of transportation. They have in fact created much new railroad business. There is plenty of traffic to be had, provided service is given which meets the needs, desires, and the pocket-book capacity of the American people. That proviso is the vital thing, and it spells for the railroads, in many respects, new methods, new equipment, new service, and new rates, and the lowest costs of operation which it is practicable to attain.

Where do the best interests of the employees lie in this situation? Let me begin with what I think is a clear and simple illustration. You know how the railroads have cut their passenger service in the past few years. Hundreds of trains have been taken off, and much local service has practically been abandoned. The result has been a great loss of employment. Can this traffic and the employment which went with it be regained or recreated? Many railroad executives seem to have given up hope on this point. The indications are that they see no way of restoring this local travel. In effect, they have kissed it good bye.

Two-Man Operation for Light-Weight Equipment

My own conviction is that they are quite wrong about this. The busses and the private automobiles will continue to carry a heavy traffic, but there are possibilities of fast, clean, cheap, local service on the rails which can even now attract paying business. Many new types of light-weight equipment operated by gas, diesel, or improved steam power are being developed which are likely soon to furnish the means of realizing these possibilities. But if these cars or trains are to be successful—and this is the big "if"—the number of men used to operate them must be kept down to a minimum. The busses ordinarily use one man per bus. Safe rail travel will not yet permit single-man operation, but in many cases I am told it will permit two-man operation.

Employees Have Everything to Gain

I do not pose as an expert on this matter, and shall make no attempt to go into details. The point is this. Here is a place where employment has already been lost. It is gone. It can only be regained by regaining or creating traffic, and that can be done only with quick, convenient, comfortable, cheap service. The railroad employees have nothing to lose and everything to gain by co-operating to the limit in such an undertaking. Safety must not be sacrificed, but if they insist upon rules or practices which make it necessary to employ more men than good service and safety actually require, they will hurt rather than help themselves As I see it, this is as plain as two plus two makes four. It applies, not only to the local, short-distance travel, but also to the long-distance, through travel. The latter is by no means immune to automobile, bus, and airplane competition. If it is to be held and increased, the best of service at the lowest reasonable cost is essential.

You may say that the way to meet this situation is to impose regulations and restrictions on the railroad competitors. There is much which should and can be done to improve the safety and employment conditions of other forms of transportation, particularly on the highways, and it may be also to secure adequate compensation for the use of transportation facilities which the government provides. But any such regulations and restrictions must be within reason, and the public interest in these other forms of transportation is so great that you certainly cannot hope for anything more. In fact, as rail employees, you are in serious danger that the railroads will themselves go into the bus and truck business as a substitute for much rail service which they now furnish.

What I have said in regard to passenger service applies also to freight service, although the conditions differ in some respects. The merchandise or less-than-carload traffic has been slipping away for years, and it is handled in most wasteful ways. There is the same need as in the passenger department for the best possible service at the lowest reasonable cost, and great opportunities for improvement. Only by using every means to that end can the railroads hope to retain and expand this business. If the employees stand in the way of such a movement, they may for the moment seem to gain an advantage, but before long they will lose much more than they have gained.

When it comes to carload traffic, I can give you a good illustration of what the railroads are up against which came to my attention last week. It is only one of many which might be given. I attended a motor truck show and saw certain types of new and very efficient trucks used by large industries for hauling products in volume. I was told that these were put in service only after it was found by most careful study that they could haul the traffic at a cost considerably below the railroad charge and only after long efforts had been made without success to secure a reduction in railroad rates.

For the purpose of cutting costs, the rairoads have for some years been increasing train tonnage, operating longer and longer trains. Under certain conditions this does result in the lowest operating cost, but I question whether the effort in this direction has not been overdone, in view of the capital costs, the terminal costs, and the delays to service which are often incurred. As in the case of the passenger traffic, I believe there is much opportunity, particularly on branch and secondary lines and in local service, for the profitable operation of quick, light trains employing cheap and very flexible motive power. The railroads are not convinced on this point, but if the time comes when they are convinced, there will be the same necessity as in the passenger service to use no more men than safety and good service absolutely require.

So far I have talked chiefly of cases where employment has already been lost and the question is whether it can be restored. There are situations, however, where the railroads could by better co-operation with each other save considerable money which they are now spending. The immediate result in such cases, in the absence of any restraining law, would be a reduction in employment. Illustrations are the unification or joint use of terminal facilities and improved methods of interline accounting. Such projects encounter certain railroad prejudices which make it difficult to bring them to the final stage of development. Assume, however, that the railroad employees are actually faced with such projects. Having in mind their own welfare, should they co-operate or resist?

Dismissal Compensation Proposed

They are certainly justified, in such cases, in demanding protection against sudden removal without any recompense and nothing to cushion the shock. It is not right or just to treat them that way, nor even wise in the

long run from the railroad point of view. Last year, as a substitute for the temporary Section 7(b) of the emergency act, I worked out a system of so-called dismissal compensation to cover such situations which I hoped could be made a permanent provision of the law. It was designed to work in harmony with the pension system and to grade relief in accordance with age and length of service, and the plan was to supplement it with a system of unemployment insurance and a placement service. I got no help from either the managements or the men, and nothing was done about it. Doubtless the plan can be improved, but some such proposition is clearly sound. It does not differ in principle from the special arrangement which you worked out last summer with the Union Pacific System.

I also concede that no such economy project should be approved which will injure railroad service. However, I am persuaded that there are many of these projects which will have the opposite effect. Instead of harming, they will actually help, good service.

Subject to these limitations, my own best judgment is that from the standpoint of their own welfare it is not wise for the railroad employees to resist these projects. I realize that the immediate results may be hard on some individuals, even under a proper system of dismissal compensation, but you cannot wisely consider such individuals alone. The test must be the greatest good of the greatest number, taking into account not only the immediate present but also the future. The railroad industry has been slipping back. I want, and I know that you want, to see it go forward. I want, and I know that you want, to see the time come again when the railroads can promote men and take on new employees to handle a growing traffic. I am also thoroughly persuaded that under present conditions the only hope of doing this is to bring costs down to the lowest minimum consistent with the furnishing of the service which is necessary to attract traffic, and this means seizing every opportunity to save unnecessary expense, however and wherever that opportunity may present itself.

Financial Reorganization Not a Panacea

Some of you have, I think, felt that the railroads have been financially exploited and mismanaged, and that if the burden of this exploitation could be removed your troubles would be over. Undoubtedly there has been much exploitation. I took quite an active part years ago, as an assistant to the present Justice Brandeis, in the financial investigation of the New Haven railroad, and I got my first knowledge of railroads in that way. But let me call your attention to the fact that in only three out of the past 20 years has the common stock of that railroad, aggregating more than $157,000,000, paid any dividends whatever; that the New Haven made up at the expense of its stockholders many of the losses incurred through unwise investments; and that, notwithstanding all this, it has now gone into bankruptcy. Sooner or later it will be financially reorganized, but however it is reorganized or however low its fixed charges become, it will still be under the necessity, if it is to thrive and grow, of giving the best possible service at the lowest reasonable cost. Meeting competition everywhere—by water, by highway, and by air—it cannot hope to prosper in any other way.

Other railroads, like the Frisco, the Rock Island, the Milwaukee, the Denver & Rio Grande, the Western Pacific, the Seaboard Air Line, and the Wabash, have been the victims of financial exploitation or mismanagement in the past; but all of these which I have named and others, some of which have been subject to no such criticism, are in receivership or bankruptcy. The investors in railroads have certainly had their share of suffering in the past few years. There are many wastes, other than the use of unnecessary labor, which have afflicted railroads in the past, and from which they should be preserved. Indeed a special investigation of the financial affairs of the railroads is now being made by the Senate committee on interstate commerce, and I have much hope that it will have good results. I wish I could go at length into this matter of financial exploitation, because there has been not a little misunderstanding as to its results and how they affected the present railroad situation. For present purposes, however, it is sufficient to say that the financial reorganization of many railroads is desirable and will have a good effect on their future credit. The way has been paved for such reorganizations by the bankruptcies or receiverships which have already occurred. Yet there is nothing in this situation which will in any way make it unnecessary for the railroads to improve their equipment, facilities, and service and to get their operating costs down to the lowest possible and reasonable basis. If the railroads could start all over again with a clean slate and a perfect capitalization made up wholly of stock backed by a profit and loss surplus and no debt, the need would still exist.

Government Ownership Possible But Doubtful

Some of you may also have the idea that your troubles would be at an end if the federal government should take over the railroad properties and substitute public for private management. This idea is in no way shocking to me, and there is much to be said for it. For reasons which I have endeavored to state quite fully, I have not been willing to recommend such a step under present conditions. It is at least possible that, regardless of theoretical considerations, we shall reach the state which many other countries have reached where, as a practical matter, it will be necessary to take the railroads over because they have ceased to be an attractive field for private capital and enterprise and no other alternative will be open. When an industry which performs an essential public function, as the railroads do, gets into that unfortunate situation, there is nothing left but government ownership and operation, and that is in fact the reason why many countries own and operate their railroads, and not any theories of Socialism or Communism.

I doubt whether we shall come to that pass, but if we do, there are certain things for which I shall fight with all the strength that is in me, and so far as my voice can be heard, and you should and I believe will agree with me. One is that the railroads shall be managed as a business and not as a political institution, and the other is that they shall be made to pay their way, so far as that is in any wise practicable, including not only operating expense and depreciation but interest on the debt incurred in their acquisition. If the government gets into this business on any other basis and at the permanent expense of the taxpayers of the country, it will be the beginning of ultimate disaster. Moreover, if the government should take the railroads over, and unless it should also take over all the other forms of transportation, which I believe would be utterly impracticable, the railroads will still be a competitive institution and under the necessity of selling their services in a competitive market with their rivals.

All that I have said may, I realize, bring a question to your minds which is of such importance that it goes to the very roots of our economic system. If labor-saving devices and methods are to become increasingly the rule, will there be enough work to go around and

will there not be a continual and constantly increasing surplus of unemployed? Theoretically, labor-saving methods and devices merely raise the speed at which a given population can produce wealth, and since we have nowhere near reached the possible limits of consumption, the result ought to minister to the needs, comforts, and even luxuries of everyone. Unfortunately, our machinery of distribution is faulty, and it does not work out that way.

This is a situation so serious that it has got to be corrected, and if it is not corrected under an economic system which we like to regard as sound and conservative, attempts will sooner or later be made to correct it in more radical ways. My own learning is not sufficient to enable me to prescribe the right remedy, but, as I see it, that general question does not affect the particular problem which I am now discussing. Whatever the economic system, you cannot wipe out the trucks, the buses, the private automobile, the steamships and the barge lines, the pipe lines, the airplanes, and the electric transmission lines, and the railroads will still be under the necessity of winning a place in the economic sun along with all these other forms of transportation.

It may be some comfort to you to say, however, that so far as my observation of our present economic system is worth anything, the most successful concerns, which give a maximum of employment in one way or another, are those which have been able to reduce their costs by labor-saving methods and devices to the point where their product is within the range of the maximum possible demand. Certainly this is true of the automobile, the radio, the electric refrigerator, and other similar products which might be mentioned. In my judgment the principle applies in railroad transportation just as much as in any of these other fields.

So it seems to me that you and the rest of the 1,000,000 employees who now have jobs in the railroad industry are confronted with a decision which requires the utmost foresight. You have suffered a good deal since 1929, and you are in danger of thinking that if you can only make the situation "stay put" in the next year or the next two years, conditions five and ten and twenty years from now will take care of themselves. There is a clash here, not so much between your interests and someone else's interest, but between your interest now and your interest in the future.

You would like to see a great increase in the number of railroad jobs. So would I. But this means an increase in railroad traffic. There will be an increase as general business conditions improve. But under present conditions the railroads will not go forward beyond that point, unless they are able to furnish the best possible service at the lowest possible costs consistent with safety, adequate wages and good working conditions.

That is why I have advocated consolidation and unification economies. I know that some men will be thrown out of work *in the immediate future* because of these economies, and I have tried to protect them by a liberal plan of dismissal compensation. But, and this is what I want you to think about, I am also confident that there will be more railroad jobs in the long run if you accept these economies now. Even during the last two years there have been thousands of railroad employees who have been separated from railroad service, not because of consolidation economies, but because there has not been enough traffic to keep them employed. I want to see an end to that condition.

Summing up what I have had to say: The railroad industry is in a transition stage of critical importance which calls for the highest degree of enterprise and initiative on the part of both managements and men, and for their full and effective co-operation. Reasonable wages, good working conditions, and necessary safety requirements ought not to be sacrificed, but preserving all these, the necessary and essential thing is to secure the greatest operating efficiency at the lowest possible cost. Anything which stands in the way of this and is not essential to reasonable wages, sound working conditions, and safety ought to go by the board. If managements and men can work together in this spirit and on this principle, I believe that there is excellent prospect of bringing the industry back to a state where it will not only hold its own but go forward.

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading for the week ended November 2 was 680,662 cars, an increase of 67,614 cars or 11 per cent as compared with the corresponding week of last year and of 66,526 cars, or 10.8 per cent as compared with 1933. As compared with the week before this total showed a seasonal decline of 27,164 cars. All commodity classifications except live stock showed increases as compared with last year and coke showed an increase as compared with the week before. The summary, as compiled by the Car Service Division of the Association of American Railroads, follows:

Revenue Freight Car Loading

For Week Ended Saturday, November 2

Districts	1935	1934	1933
Eastern	143,036	129,935	133,530
Allegheny	127,551	111,500	114,590
Pocahontas	50,724	43,099	42,883
Southern	96,736	91,378	88,653
Northwestern	93,864	81,457	77,292
Central Western	110,808	101,225	102,689
Southwestern	57,943	54,454	54,499
Total Western Districts	262,615	237,136	234,480
Total All Roads	680,662	613,048	614,136
Commodities			
Grain and Grain Products	33,364	27,887	31,155
Live Stock	19,553	24,568	20,017
Coal	125,483	125,354	119,765
Coke	7,016	5,745	6,098
Forest Products	29,194	21,687	23,181
Ore	21,692	10,707	15,078
Merchandise L.C.L.	165,576	161,967	171,968
Miscellaneous	278,784	235,133	226,874
November 2	680,662	613,048	614,136
October 26	707,826	624,808	642,423
October 19	732,947	640,727	657,005
October 12	734,274	636,999	670,680
October 5	706,877	632,406	662,373
Cumulative Total, 44 Weeks	26,701,004	26,510,440	24,861,297

The freight car surplus for the first two weeks in October averaged 220,199 cars, a decrease of 8,321 cars as compared with the number in the last part of September. The total included 125,425 box cars, 59,283 coal cars, 18,344 stock cars, and 6,596 refrigerator cars.

Car Loading in Canada

Car loadings in Canada for the week ended November 2 totaled 52,094, according to the compilation of the Dominion Bureau of Statistics.

	Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada:		
November 2, 1935	52,094	22,710
October 26, 1935	52,800	21,809
October 19, 1935	56,285	22,736
November 3, 1934	51,967	19,502
Cumulative Totals for Canada:		
November 2, 1935	1,994,862	936,041
November 3, 1934	1,968,062	945,505
November 4, 1933	1,706,816	810,436

The Coal Industry and the Railroads*

Co-operation of carriers enlisted in fight to preserve important source of freight revenue

By John D. Battle
Executive Secretary, National Coal Association, Washington, D. C.

THERE are some practical matters that need the immediate attention and consideration of the men who are devoting their lives to the railroad industry as it specifically relates to the use of coal. Bituminous coal furnished 46.3 per cent of the total energy of the country in 1934, while in 1923 it furnished 60.5 per cent, a decrease of 23.5 per cent. During the same period, the part furnished by natural gas increased from 4.5 per cent to 8.7 per cent; by oil, from 20.0 per cent to 26.9 per cent; by hydro-electric energy from 4.6 per cent to 9.3 per cent.

Gas and oil move in pipe lines, and electric energy is transported over wires, yielding no freight revenue to the railroads and creating no employment or payrolls for them. After making due allowances for the natural tendency of the American people to want innovations and conveniences claimed by the sellers of oil, gas, and hydro-electric energy, and after giving careful consideration to what might be termed the natural markets of these commodities and their inherent right to exist, the stark fact confronts us that the production and movement of bituminous coal has decreased at least 200 million tons annually, a traffic that should not have been lost to the railroads.

Federal Projects Threaten Coal

The coal industry has opposed, and will continue to oppose, the unlawful production and sale of power by the United States Government in competition with power produced by bituminous coal. But this is not alone our fight. It is a fight in which the railroads are interested. I make only brief reference to one outstanding project, namely, the Tennessee Valley Authority, though there are others just as important. In the generation of hydro-electric power, each kilowatt year represents six tons of coal. T.V.A. proposes hydro-electric plants with an annual output of 1,000,000 kilowatt years, based on 50 per cent of a total capacity of 2,000,000 kw. This power output, if produced by coal-burning plants, would utilize on an annual basis more than 6,000,000 tons of coal. This is not the whole story, for the consumption of T.V.A. hydro-power, when and as consumed in substitution for coal-burning equipment, tends still further to deprive coal of its markets, to the extent of millions of tons annually.

Every million tons of coal displaced in the Tennessee Valley or elsewhere results in the elimination of 20,000 carloads of coal (400 trains of 50 cars each) and the elimination of the employees required to operate them; in a loss in railroad freight revenue of over $2,000,000, in connection with which it is observed that 50 cents of each railroad revenue dollar goes to labor; in the loss of $1,000,000 annually in the pay envelopes of mine employees, considering that 65 per cent of the cost of producing coal is labor cost; in the loss of employment and pay to many others indirectly engaged in the production, transportation and merchandising of coal; in the elimination in the aggregate of 1,000,000 work days, for each ton of coal lost is estimated to represent the loss of one day's work directly or indirectly employed in the production and distribution of coal; in the permanent closing down of hundreds of mines, upon some of which whole communities are dependent for support.

High delivered cost of coal has had something to do with this effort to promote cheap power produced by the Government; therefore, I wish to call attention to the trend in railroad transportation charges. The average freight rate on bituminous coal in 1914, from the best information available, was less than $1 per ton. The average in 1934 was $2.15 per ton, an increase of more than 115 per cent. In 1914, the average f.o.b. mine price of coal throughout the United States was $1.17 per ton. There was very little difference between the average mine price and the average freight rate, the average freight rate being less than the avrage mine price. That situation has completely reversed itself, and, omitting the years of the War and shortly thereafter when conditions were wholly abnormal, the trend of mine prices was steadily downward over a period of years until it reached the low average of $1.31 in 1932. It was just three cents above that figure in 1933, during which years the average freight rate exceeded the average mine price by almost $1 per ton. Owing to Federal regulation of all industries, the mine price increased in 1934 to $1.82 but, nevertheless, was still 33 cents below the average freight rate. When high delivered cost of coal is referred to, the transportation cost represents the greater portion of that price.

If we view the displacement of coal from every possible angle, we find one contributing cause which is often overlooked and perhaps is practiced unconsciously to the detriment of all concerned. Take a large manufacturer in Chicago whose power requirements are equivalent to 500,000 tons of coal annually. For some reason or other, he decides to burn natural gas. Let us assume that the average of the freight rates on coal from the various producing districts which reach the Chicago market is $2.50 per ton. Thus, 500,000 tons of freight traffic and $1,250,000 of freight revenue are lost to the railroads.

Competitive Fuels

In the great chain of selling and purchasing, the railroads are customers of that manufacturer. Their purchasing power and the purchasing power of the employees who would have been given employment in moving this tonnage is, therefore, lost to the manufacturer, to say nothing of the purchasing power of the coal producing company and its employees, to which this tonnage has also been lost. If this situation, which is happening daily, were brought forcibly by the railroads to the attention of the manufacturer, he could

* From an address to the International Railway Fuel Association, Chicago, on September 19.

find little, if any, justification for burning this laborless fuel. This is one way in which the railroads, through their purchasing and other departments, can help themselves, the coal industry, the employees of all, and the manufacturer who is unconsciously or otherwise following a practice which is demoralizing to all the interests concerned.

No industry has passed through a more trying time than the bituminous coal industry during the past two years. On October 2, 1933, it began to function under a so-called code of fair competition. This code was promulgated jointly by the Federal Government, the producers of coal and the representatives of organized labor. It required a vast amount of administrative machinery. Code Authorities were established throughout the country whose duties were to classify coals, fix reasonable prices thereon, and, with the approval of the Federal Government, promulgate such prices and supervise the general operation of the code. The National Industrial Recovery Act, under which coal codes were operating, was declared unconstitutional by the United States Supreme Court on May 27, 1935, and all Code Authorities ceased to function thereafter.

What the Guffey Bill Means

For some time prior to the decision of the Supreme Court, special legislation for the coal industry had been a subject of discussion and consideration. As the code under the National Recovery Administration began to break down, an intensive drive was put forth by a group of coal operators, supported by labor, towards enactment of special legislation designed to regulate the bituminous coal industry. Opposition to this proposal was vigorously voiced by another group of coal producers. Neither of these groups was confined to particular geographical areas. These differences of opinion, as between those who supported the legislation and those who opposed it, were forcefully presented to the Congress of the United States. However, just before adjournment of the last session, Congress enacted what it has termed the Bituminous Coal Conservation Act of 1935. The President of the United States signed this bill August 30 last. The bill declares that the mining and distribution of bituminous coal are affected with a public interest, and that because of their relationship to industrial activities and transportation facilities, the general welfare of the nation requires their regulation. It declares that the production and distribution of bituminous coal bear directly upon and affect its interstate commerce, and that regulation of production is necessary to protect such commerce, etc.

A Coal Commission of five is created, to be named by the President of the United States. A Consumers' Counsel is to be named by the President for the purpose of protecting the consuming public against any undue increase in the price of coal. A tax of 15 per cent on the selling price of coal is imposed, with a 90-per cent drawback provided for those who comply with the provisions of the Act. A coal code is to be promulgated by the new Commission. Twenty-three district boards are to be set up throughout the country, patterned somewhat after the code authorities heretofore mentioned, and on these boards labor is to have a representative. These boards are to establish prices and classify coals, all subject to the approval of the Coal Commission. Marketing areas are prescribed and methods of price determination outlined. Unfair methods of competition are set forth and specifically prohibited.

A labor board of three members is created by the bill, one to represent labor, itself, one to represent the producers of coal, and one to serve as the impartial chairman. Its duty is to offer its services as mediator and to pass upon provisions of the Act pertaining to representation of employees with regard to collective bargaining. Marketing agencies may function under this law with the approval of the Coal Commission. The Coal Commission may file complaints with the Interstate Commerce Commission against freight rates on coal and may participate in hearings on complaints filed by others. The Government may buy coal only from those who agree to comply with the provisions of the Act, and must compel those making contracts with it to observe the same rule. Contracts may not be made for a period of more than 30 days, pending the promulgation of prices provided in the Act. Contracts made since May 27, 1935, at prices below regular code prices promulgated under N.R.A. supervision, are declared unenforceable.

The Commission shall study the matter of increasing the use of bituminous coal. The economic operation of mines, with the view to conservation of coal and also with respect to safety, is a study provided in the Act. The rehabilitation of mine workers displaced or only partially employed is a matter for the Commission to study. The problem of marketing so as to lower distribution costs for the benefit of consumers must have the attention of the Commission. The Commission must study the question of production control. The law applies to bituminous, semi-bituminous and sub-bituminous coal, and lignite. Its life is four years from August 30 last.

Under the recent law enacted by the Congress of the United States, trucks operating in interestate commerce are subjected to Federal control. I am not sure what effect this will have on the movement of coal by trucks, although I dare say that a great portion of this trucking will not come within the range of the Federal statute but will be subject only to state regulation. There is one fact that I think we may well recognize as inevitable, and that is that trucks are here to stay. That condition will have to be met, and if the railroads expect to move coal in competition with trucks, they must be prepared to do that which all business people do—meet the competition as they find it. Mere regulation of a competitor by the Government is not sufficient. Ways and means will be found by those in the business to promote the use of trucks. This truck movement must of necessity be confined to the shorter hauls of coal, though I have reports of coal being trucked 400 miles. When it is considered that the proximity of coal to some of our large industrial centers is generally conceded to have been the predominant factor in the upbuilding of some of these centers, I cannot help but view the movement of coal by trucks seriously, especially as it affects the railroads and reacts against their net earnings.

Industrial America owes its existence to low power costs. Coal was the prime factor as a source of energy in its upbuilding. There can be no substantial improvement until coal again represents low power costs, and there can be little or no lower delivered coal costs unless rail transportation charges are adjusted. If the coal mines are to remain the backbone of the transportation system of this country, it must be accomplished by an increase in traffic. Those in charge of the rail lines must bear in mind that they have but one commodity to sell—transportation. It must be sold in a competitive market. This market today is crowded; hence, a seller of transportation must so adjust his charges as to create rail traffic rather than destroy it. I believe the time has come for the railroads to turn their eyes toward these grave questions of policy, and out of their vast experience, devote attention to increasing the use of bituminous coal, industrially and commercially, thus helping to restore its movement to the railroads.

Boston & Maine Rail Car No. 1141 Which is Equipped with a Westinghouse 12-Cylinder, V-Type, 800 Hp. Diesel Engine. This Power Unit, Weighing 250,000 lb. Ready for Service, Has Space for Baggage and Mail But Not for Passengers

Boston & Maine Rail Car Equipped With Supercharged Diesel Engine

Power unit, with baggage and mail compartments, is capable of attaining a maximum speed of 86 m. p. h.

By J. R. Wilson

Westinghouse Electric & Manufacturing Company

MUCH has been written during the past year about the light-weight trains of articulated construction, using aluminum or stainless steel, propelled by Diesel-electric motive power. In each instance, these trains involve the purchase of complete passenger-carrying equipment as well as the motive power from which the principal economies in operations are derived.

The railroads of the United States have available approximately 20,000 passenger-train cars less than 20 years old representing in value approximately one-half billion dollars which, for years to come, must handle the bulk of the traffic.

This condition is fully realized by many of our more important trunk line systems and some few of them, including the Boston & Maine, are planning accordingly, and leading the way in the utilization of motive power of adequate capacity to handle trains made up of standard baggage cars, coaches, and Pullmans at present day schedules and at the same time realize the economies effected by Diesel-electric drives.

To meet this need, the Westinghouse Electric & Manufacturing Company has developed a Diesel-electric power unit consisting of a standard 12-cylinder, four-cycle Diesel engine, supercharged to obtain the required power, with electrical transmission and auxiliary equipment to match the engine capacity.

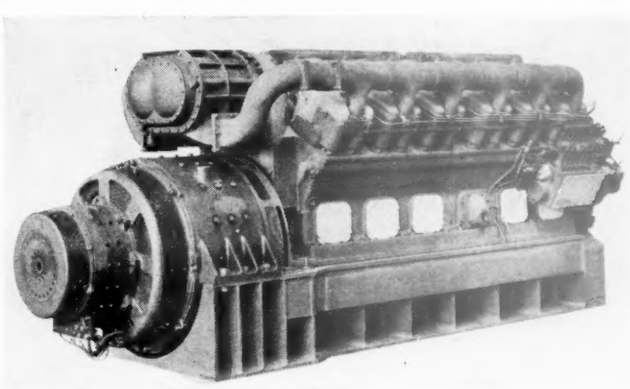
One of these equipments started initial service last August on the Boston & Maine, mounted in a combination mail-baggage unit.

Since going into service it has handled trains up to seven trailing cars, consisting of standard-weight day coaches and Pullman cars, on existing steam locomotive schedules.

The principal dimensions of the motor car are as follows:

Length over body	78 ft.	0	in.
Truck center distance	56 ft.	4	in.
Length of operator's cab and engine room	25 ft.	0	in.
Length of mail compartments	15 ft.	1	in.
Length of baggage and boiler compartment	37 ft.	11	in.
Height over engine-room roof	14 ft.	0	in.
Height over baggage compartment	12 ft.	11¾	in.

The front end of the car body is mounted on a six-wheel truck of which two of the axles are motor driven, while the rear end is mounted on a four-wheel truck,



The Westinghouse 12-Cylinder, 800-Hp. Diesel Engine

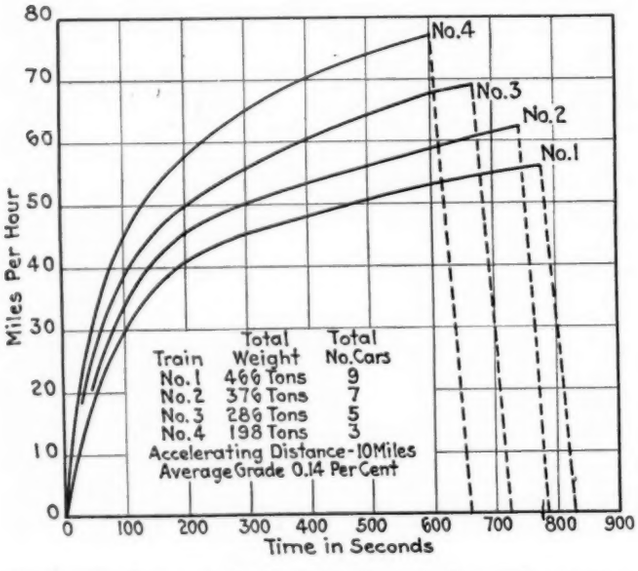
both axles of which are motor driven. The total weight of the power car, including 14,000 lb. of supplies and 25,000 lb. of mail and baggage, amounts to 250,000 lb., equally distributed between the five axles. This conservative axle loading permits operation over existing bridges and light-weight rail.

Car Body and Trucks

The car body and trucks were furnished by the St. Louis Car Company. The details of the design were prepared jointly by the mechanical department of the Boston & Maine and the car builder. Welded construction is used throughout in the underframe.

Two 9-inch, 25.4-lb. ship channels with an 18-in. by ¼-in. top cover plate and an 18-in. by ⅜-in. bottom cover plate form a box-girder center sill. Draft sills, consisting of ⅜-in. plates, 16 in. deep, with the lower edge flanged 2½ in. welded to the center sill channels along the web at the upper edge and to the lower flange, extend from the bumper to the first needle beam.

Front and rear bolsters and needle beams are fabricated from steel plates, cut to shape, and welded together to form box girders and I-sections, respectively. Cross bearers are of 5/32-in. channel pressings, having 5-in.



Acceleration Curves of the B. & M. Car with Four Different Train Weights

webs and 2-in. flanges, welded to the center and side sills along all contact edges. High-tensile Man-Ten steel is used throughout in the underframe.

The engine room floor plate is welded to the center sills, side sills, bumper face plate, front bolster and webs of needle beams to form an integral oil-tight frame from the bumper to the rear end of the engine room. Structural shapes are welded to front bolster, needle beams, and floor plates for anchoring the power plant. The engine-room roof is designed to accommodate cooling radiators, intake silencers and air strainers, and exhaust stacks. The front portion of the roof is removable from side plate to side plate for installation of the power plant as a unit.

A bulkhead separates the engineroom from the operator's cab.

The construction of the floors, sides and roofs of mail and baggage compartments conforms with standard railroad practice and these parts are insulated throughout with Johns-Manville light-weight Salamander.

The railway post office compartment conforms with U. S. Postal regulations and specifications in every respect.

A Vapor Car Heating Company's oil-fired boiler, automatically controlled, having a capacity of 1,000 lb. of steam per hour, is located at the rear end of the baggage compartment. A water tank of 6,000 lb. capacity, filled through the car roof from standard filling plugs, is mounted adjacent to the boiler.

The trucks have integral cast-steel frames, rolled-steel wheels, Timken bearings on 6-in. by 11-in. journals and clasp type brakes operated by 14-in. by 10-in. cylinders, mounted one on each truck.

The Diesel Engine

The Diesel engine of this rail car is of the four-cycle supercharged type. The supercharger is of the Root type, mounted on the crankcase above the generator and driven from the crankshaft by a train of gears located at a nodal point in the shafting system which, together with the spring-loaded friction clutch, minimizes the possibility of vibratory forces in the supercharger drive.

Air is dawn from outside of the engine room through air strainers and intake silencers and delivered by the supercharger to manifolds leading to the inlet valves at approximately five pounds per square inch above atmospheric pressure. The relative timing of inlet and exhaust valves permits a thorough scavenging of the exhaust gases and insures filling the cylinders with air at blower pressure, resulting in a substantial increase in power output from the increased weight of air per cycle for combustion of fuel, compared with the non-supercharged engine.

The following summarizes the details of the Diesel engine:

Type	12-cylinder, vee
Speeds	Variable, 380 r.p.m. idling; 900 r.p.m. at full load
Bore and stroke	9 in diameter, 12 in. long
Crankcase	Integral steel casting, machined for cylinder liners and heads and crankshaft main bearings
Cylinder heads	Aluminum-alloy casting with steel inserts for inlet and exhaust-valve seats
Crankshaft	Chrome-molybdenum steel forging, machined throughout and counter-balanced
Cylinder liners	Nickel cast iron
Pistons	One piece, aluminum alloy, self cooling
Camshafts	Integral steel forgings, gear driven
Piston rings	Four compression and two oil-control rings
Piston pin	Full floating type
Connecting rods	Forged steel, heat treated, with bronze bushing for piston pin
Main bearings	Babbitted steel shell, 6 in bore
Connecting rod bearings	Babbitted bronze shell, 5.75 in. bore
Torsional vibration damper	Inertia type with spring loaded friction disks
Fuel pump	Constant stroke, variable cut off type, one per cylinder, gear driven
Atomizer	Spring loaded with quick cut off
Governor	Variable speed, hydraulic type
Timing	Automatically varied with engine speed
Valves	Dual inlet and exhaust of silchrome steel
Valve rocker arms	Of forged steel, operating in sleeve bearings with valve clearance adjusting screw
Inlet and exhaust silencers and air filters	Burgess type
Bedplate	Welded steel construction, dry sump type, enclosing lubricating oil reservoir
Water pump	Centrifugal type, gear driven
Lubricating oil pressure pump	Gear type, gear driven
Lubricating oil scavenging pump	Gear type, gear driven
Governor oil pump	Gear type, gear driven
Lubrication	Pressure system, throughout

A single-bearing main generator, mounted on the engine bedplate converts the mechanical power at the engine shaft into electrical energy for use by the traction motors. The engine and generator shafts are rigidly connected together by fitted driven bolts and dowels with the flywheel web interposed between the flanges. The flywheel bore engages both engine and generator shafts, maintaining concentricity. The outer end of the generator shaft is supported on a self-alining ball bearing, of

which the inner race is pressed on the shaft and the outer race has a sliding fit in the bearing bracket. All end thrust is taken on the thrust faces of the number seven crankshaft bearing. The main generator is used as a motor for cranking the Diesel engine during starting, utilizing power furnished by a storage battery. It is also used to supply power for compressor operation, lighting and battery-charging during engine idling periods.

A 125-volt auxiliary generator with its stator and armature mounted on the main generator bearing bracket and shaft respectively, furnishes power for all auxiliary loads and battery during full-speed operation of the engine.

A centrifugal fan mounted on the generator side of the engine flywheel draws air through main and auxiliary generators for cooling these machines.

Traction motors of the direct-current, series type, geared to the driving axles, supply the propelling force for the car. They are equipped with roller-type armature bearings and sleeve-type axle bearings, and connected with two motors permanently in series.

The car is equipped with a single control station for one-man operation. A master controller having mechanically interlocked speed and reverse levers utilizes battery current for control of electro-pneumatic car reverser, motor line switches, magnetically operated field contactors and engine governor operator. The engine speed may be varied between idling and full speed by the operator to meet the demand for power. Push buttons provide for starting and stopping the engine from the operator's position and for operation of other auxiliaries, such as head light, back-up light and auxiliary manual control of the radiator blowers.

A locomotive type air-brake equipment furnished by the New York Air Brake Company, including safety control features and straight and automatic air brake on the motor car and automatic brake on the train, provides the braking power. An illuminated quadruplex gage provides the customary indications of air pressures.

A streamlined headlight, classification lights and number lights are built into the head end of the car. An air-operated bell and Leslie single and dual Tyfon horns are mounted on the sub roof directly over the operator's cab.

A 120-cu. ft. displacement, single-stage, water cooled air compressor furnishes compressed air for the motor-car and train brakes. Automatic transfer of the compressor motor circuits from the main generator to the auxiliary generator and vice versa provides for full-speed operation of the compressor set during both idling and full-speed operation of the engine.

The engine water and oil-cooling radiators, located above the sub roof over the engine room are force ventilated by motor-driven fans. When the engine is stopped, the water and oil in the radiators drain to reservoirs in the engine room. This self-draining feature eliminates the need for anti-freeze solutions in the jacket water during freezing weather. The radiator blower motors are thermostatically controlled, thus providing for maintaining the most satisfactory operating temperatures of both lubricating oil and jacket water without the use of shutters and at the same time, reducing the power demand of the blower motors to that required for engine cooling.

A 54-cell, 15-plate Ironclad battery, furnishes power for engine starting, lighting and control, and is charged from main or auxiliary generator, depending upon the engine speed.

Fuel-oil storage tanks of 600 gallons capacity are suspended under the car body. The tanks are lagged and jacketed and provided with steam heating coils for use as needed. Motor-driven gear type pumps deliver the oil to the engine and boiler as required.

An illuminated meter panel provides indication of main generator amperes and volts, battery-charging current, engine jacket water and lubricating-oil temperatures, lubricating-oil pressure and car speed.

The speed indicating meter is actuated by a Westinghouse electric tachometer, mounted in a special cover on one of the Timken bearing boxes. The rotor of the tachometer consists of a permanent magnet of cobalt steel which is driven from the end of the axle. A Rectox unit rectifies the alternating voltage generated in the stator, providing uni-directional indication on the panel meter.

Engine loading is controlled by the Westinghouse torque control system, modified to suit the large capacity power plant.

Fuel and Oil Consumption on Two Typical Runs

RUN A	
Total train weight	180 tons to 300 tons
Number trailing cars	1 to 3
Daily mileage	290
Number regular passenger stops	33
Number of flag stops	14
Gallons of fuel oil per 1,000 ton miles	3.18
Gallons of lub. oil per 1,000 ton miles	.029
RUN B	
Total train weight	306 tons to 626 tons
Number trailing cars	3 to 7
Daily mileage	334
Number regular passenger stops	35
Number of flag stops	3
Gallons of fuel oil per 1,000 ton miles	2.08
Gallons of lub. oil per 1,000 ton miles	.033

Service Capacity

The traction motors are geared to develop a maximum starting tractive force of 45,000 lb. at the rail and a maximum car speed of 86 m.p.h. The tractive force at the continuous rating of the traction motors is 12,300 lb.

The results of a series of acceleration tests made by the Boston & Maine while operating on a 0.14 per cent grade are shown by curves in the chart.

Fuel oil and lubricating oil consumption on two typical runs are shown in the table.

* * *

The Southern's "Royal Palm" Near Ludlow, Ky.

Communications and Books . . .

Sales and Advertising Talent Costs Real Money

BALTIMORE, MD.

TO THE EDITOR:

> "The railroads are not good advertisers or good salesmen." *Railway Age,* November 2.

Why aren't they? For the very good reason that no railroad is willing to pay the market price for really first-class advertising or sales ability. Both are available, but *not* at the figure railroads regard as ample.

J. M. C.

Railway Location a Half Century Ago

MINNEAPOLIS, MINN.

TO THE EDITOR:

I have been very much interested in the short article which appeared in your issue of October 26, page 552, describing the rehabilitation program for the Baltimore & Annapolis railroad. I ran the front rod and pulled the chain on the original survey for this railway in 1885 and 1886. The following notes, which are taken verbatim from my diary of that year, shed some light on the work—and the pleasures—of a railway locating engineer a half century ago.

Wednesday, September 16, 1885—Up at 6 a.m. Had breakfast about 6:30. Off to work at 7. We worked along, running in curves, intersection points and tangents. We stuck at it pretty steady. We ate dinner about 12:30 alongside a spring at the head of the swamp running in from the Severn river, about one mile above Annapolis. The spring was full of "wiggletads" which one man said turned into mosquitoes. We worked until about 6 in the evening when we came into Annapolis for supper.

Thursday, September 17.—Up and at work about the same time as yesterday. Worked in on permanent location today. Wore boots all day. My feet got right tired. We got in about 6:30 p.m.

Friday, September 18.—Mr. Janney, engineer in charge, left us this a.m. for Baltimore. R. Bruce Hook is chief of party. We crossed to the north side of the Severn river about 11:30 a.m. We bought a bushel of oysters for 40 cents which we ate raw. They were very fine. When we got over the river, we had a swim and then dinner. We had a fine sail across the river and also when we came home, we had to tack down the river at Annapolis. We got in about 6:30 p.m. Very tired.

R. G. KENLY,
Chief Engineer, Minneapolis & St. Louis.

New Books

Steel of Empire, by John Murray Gibbon. 423 pages, 9 in. by 6 in. Illustrated. Bound in cloth. Published by the Bobbs-Merrill Company, Indianapolis, Ind., and New York. Price, $3.50.

This is a history of the Canadian Pacific but it is a different kind of railroad history because the author, calling his work "The Romantic History of the Canadian Pacific, the Northwest Passage of Today," has placed the remote genesis of this great transcontinental line in a period before Canada as such was known—in the age-old dream of the Northwest passage to Cathay. Mr. Gibbon's sub-title and point of view were inspired by a cartoon from the October 15, 1887, issue of Punch (London) which pictured Britannia pointing with pride to the C.P.R. as "The New North-West Passage." "In that title," he says, "was summarized the history of four hundred and forty years of exploration and valiant enterprise starting from the first voyage of John Cabot to Hudson's Strait and continuing in the ventures of Martin Frobisher, John Davis, Francis Drake, Henry Hudson, William Baffin, Luke Fox, Thomas James and countless others in search of a passage through the frozen seas north of America, changing into the overland passages of the fur traders who found in the rivers, lakes and portages a waterway that might be arduous and yet was feasible, and culminating in the double track of steel which skirted lakes, bridged rivers, crossed the prairie plateaux, penetrated the mountain passes and rock-walled canyons to link Atlantic with Pacific."

Thus for the first one-third of the book one hears little of the Canadian Pacific but much about explorers, pioneer fur traders Hudson's Bay Company agents and picturesque native voyageurs —all in a fascinating background constructed with the aid of apt quotations from these adventurers' songs and contemporary accounts of their exploits.

Then the Canadian Pacific enters the picture in connection with British Columbia's agreement to join the Dominion on condition that a transcontinental line be built. Here the reader meets, among others, Sir John A. Macdonald, conservative premier of Canada and "Father of Confederation;" Donald A. Smith (later Lord Strathcona) and George Stephen (later Lord Mount Stephen), financiers and C.P.R. pioneers, the latter its first president; James J. Hill, who was among the C.P.R.'s initial promoters but who withdrew when his associates in that enterprise decided to build a line north of Lake Superior instead of remaining content to connect at the border with Hill's St. Paul, Minneapolis & Manitoba; and Henry Beatty, lake-boat operator whose lines were merged into C.P.R. marine services, and who was the father of Sir Edward Beatty, present chairman and president of the C.P.R.

Although Mr. Gibbon is general publicity agent of the Canadian Pacific the sections of his book dealing specifically with events in that road's history constitute no special pleadings; while he is naturally a sympathetic chronicler, he has nevertheless produced a well-authenticated account of a great transportation enterprise, conceived from the outset, he shows by reference to the original charter, "as a steamship as well as a railway company." Thus the C.P.R.'s ultimate goal was not reached until "Liverpool and Southampton could be linked with Hong Kong by a system of operating rail and steamships across two oceans and a continent under one flag."

How the foregoing ideal has been realized is told in lively accounts of the activities of successive C.P.R. chief executives —of Sir William Van Horne's aggressive determination to complete the rail line; of Lord T. G. Shaughnessy's intensive development and improvement of that line, its traffic and its auxiliary steamship and other enterprises; and of Sir Edward Beatty's "rounding-out" policies and public relations activities in his endeavors to make the Canadian Pacific a "good citizen" and to aid in the solution of Canada's railway problem—offering to the Dominion in his plan for unified operation of the C.P.R. and Canadian National what Mr. Gibbon calls "a blood transfusion to an anaemic patient."

Finally, no review of this fascinating book would be complete without enthusiastic acclaim for its numerous well-selected illustrations; these include 17 full-page color plates, 64 pages of halftone engravings and about 150 line drawings.

Bethlehem Alloy Steels—376 pages. 6 in. by 9 in. Illustrated. Bound in flexible fabrikoid. Published by the Bethlehem Steel Company, Bethlehem, Pa. Price $1.

The scope of this book is much broader than the name implies, for with the exception of two short introductory chapters on the production facilities and quality control of the Bethlehem Steel Company, the text matter is of a distinctly general nature, being designed to give users of alloy steels dependable working data on properties and performance and to bring all pertinent existing data on these alloy steels up to date in one volume. The subject matter is divided under six main divisions, namely: Part 1, Grades of Steel; Part 2, Steels for Specific Uses; Part 3, Testing and Properties of Steel; Part 4, Working of Steel; Part 5, Definitions of Common Terms; Part 6, Tables and Useful Information.

While this book is designed primarily to serve as a ready reference work, it will prove valuable also to any one who desires to broaden his knowledge of the entire field of special steels, their properties, composition, heat treatment. etc. Among the many illustrations are color charts of heat colors and temper colors.

Odds and Ends . . .

Blue Laws

The Boston & Maine has dug up a timetable of one of its predecessors, issued in 1850, showing the operation of a Sunday train, with this important requirement:

"Persons purchasing tickets will be required to sign a pledge that they will use the tickets for no other purpose than attending church."

Locomotive Movie Stars

One of the Pennsylvania's new streamlined electric locomotives plays an important role in the fifth issue of the movie, March of Time, featuring the mobility of today's army and a pre-enactment of the Pine Camp concentration held near Watertown, N. Y. Pennsylvania trainmasters, in charge of the operation, cleared tracks and issued orders while camera crews spent several days photographing the loading of the trains, the departure and the arrival at the unannounced destination.

Crickets at Grand Central

Above the usual noises of one of the world's greatest passenger terminals, the cheery chirruping of crickets could be heard recently. It happened at Grand Central station in New York and undoubtedly represents the first time in a century or more that crickets could be heard near 42nd street. The occasion was the opening of an exhibit by the New York state conservation department at Grand Central, which included real pine trees, a log cabin, a canoe and other backwoods objects, in addition to the aforementioned crickets.

Oldest Safe?

The Norfolk & Western's historical collection has "inherited" from Colonel W. S. Battle, Jr., recently retired vice-president of the railway, a unique safe. Bearing the inscription, "Patented on June 3, 1843," the ancient stronghold is around 75 years old and weighs 2,000 lb. No combination type, its contents are made secure by a heavy iron bar across the doors and a huge padlock that weighs two pounds. Five keys are required to open the numerous doors and compartments of the old-fashioned cash box. It is mounted on large steel rollers and is equipped with handles on each side to facilitate its movement from place to place.

Showing Regulation of Highway Traffic Is Not New

"Now mind," said a sharp thin voice in the dark. "I and my son go inside, because the roof is full, but you agree only to charge us outside prices. It's quite understood that we won't pay any more. Is it?"

"All right, sir," said the guard.

"Is there anybody inside now?" inquired the voice.

"Three passengers," returned the guard.

"Then I ask the three passengers to witness this bargain, if they will be so good," said the voice. "My bob, I think we may safely get in."

In pursuance of which opinion, two people took their seats in the vehicle, *which was solemnly licensed by Act of Parliament* to carry any six persons who could be got in at the door.—From "Martin Chuzzlewit," by Charles Dickens.

The Commuter

The New York Sun of September 24 devoted a great deal of space to an article on the railway commuter. The article describes in detail the exact technique of commuting, including the proper place to keep tickets, the proper way to read the newspaper, and the proper way of getting on and off trains. Among other things, its author has this to say: "The really accomplished commuter is born, not made. He is an artist. He shows an adeptness, a facility, a love for the art of commuting which is obviously the result of being born with a commutation ticket in one hand and a watch in the other. However, the ordinary mortal can attain near perfection, at least, in this art by dint of perseverance and assiduous study of the master commuters. There has been no appreciable revolution in commuting as there has been in the other arts, for years; at least, not since the days of stage coaches."

Fullback Now a Vice-President

This fall, for the first time in 47 years, the football team of Yale University goes to Philadelphia, Pa., to play the University of Pennsylvania. This may be of interest to railroaders when it is considered that the star fullback of the Pennsylvania team which played Yale nearly half a century ago was Thomas W. Hulme, now vice-president in charge of real estate, valuation and taxes for the Pennsylvania.

Switchback for Sale

Mauch Chunk's roller-coaster switchback railroad, which once carried 50,000 passengers a year and never had an accident, is up for sale. Owners of the 18 miles of up-and-down track, 9 miles to Summit Hill, Pa., and 9 miles back to Mauch Chunk, say the buyer can name his own terms. For a long time they have had little use for it. The first section of the line was laid in 1827 to bring coal from Summit Hill to the Lehigh river. Gravity took coal cars down to the river and mules brought them back. The coal rode down in one section of the cars, the mules in another. In 1844, the backtrack was built to get rid of the mules. Steam power lifted cars on the backtrack at Mauch Chunk to Mt. Pisgah, 1,500 ft. up. There they coasted away toward Mt. Jefferson plane, six miles distant. At White Bear, at the foot of the plane, the cars were hoisted again to 1,662 ft. That gave them enough elevation to finish the trip to Summit Hill. Built for the Lehigh Coal & Navigation Company, the railroad was abandoned as a coal route in 1870 and turned over to the tourist and joy-riding trade. Passenger service continued for years, then a series of detours on roads leading into Mauch Chunk cut into the trade and the line was abandoned.

World Interest Attracted to Ethiopian Railway

In case of war, railways become a vitally important factor, and this is causing world-wide attention to be directed upon the only railway in Ethiopia, the present scene of hostilities.

The 487-mile, meter-gage line is a French concession and was built by French capital, at a cost of approximately $23,000,000. The construction expense was materially increased by the fact that, after crossing a desert, the line must climb to the high central Ethiopian plateau, through extremely mountainous country. Djibouti, the tidewater terminus of the railway in French Somaliland, is of course at sea level, while Addis Ababa, capital of Ethiopia and the inland terminus, is 7,700 ft. above sea level. To cross the mountains, the line uses one pass at 8,000 ft. elevation.

Work was begun on the line in 1897, but political and financial difficulties prevented its extension much beyond the frontier of French Somaliland until 1909. In the following four years, the line was extended 93 miles farther inland, this construction involving a bridge 500 ft. long and 200 ft. above the level of the Hawash river. The World War caused a slowing down of the work, and it was not until June, 1917, 20 years after construction began, that the line finally reached Addis Ababa.

Because of the raids by wild tribes in the territory it traverses, the railway was limited to daytime operation until 1926, when the increasing effectiveness of policing the line made normal operations safe and possible. The express passenger trains now make the 487-mile run in 33 hr., while a five-day freight schedule is maintained.

Equipment owned by the railway consists of 54 locomotives, 46 passenger cars and 445 freight trains. Between 150,000 and 300,000 passengers are carried yearly and about 75,000 tons of freight in normal times, although, under the existing emergency, it is certain that both passenger and freight traffic will show a heavy increase over these figures in 1935. The railway employs 150 Europeans and approximately 1,500 natives under ordinary circumstances.

NEWS

A.A.R. Holds Annual Meeting at Chicago

Action on pick-up and delivery, unification of terminals and retirement act

An extension of pick-up and delivery service, revision of merchandise freight rates, unification of terminals and the retirement act were the major subjects acted upon at the annual meeting of the Association of American Railroads at Chicago on November 7 and 8. This was the first annual meeting since the formation of the association one year ago by the consolidation of various railroad activities, including the Association of Railway Executives and the American Railway Association. The first day was devoted to a discussion of what had been accomplished during the past year, while on the second day plans for the coming year were considered.

Following the passage of an amendment increasing the Executive Committee from five to not less than five and not more than seven, M. W. Clement, president of the Pennsylvania, was elected a director and a member of the Executive Committee. The committee now includes, in addition to Mr. Clement, Carl R. Gray, president of the Union Pacific; Fairfax Harrison, president of the Southern; H. A. Scandrett, trustee of the Chicago, Milwaukee, St. Paul & Pacific; Daniel Willard, president of the Baltimore & Ohio; and F. E. Williamson, president of the New York Central.

As a result of a discussion of the railroad retirement acts of 1934 and 1935, the members authorized their legal department to study the latter act, which becomes effective March 1, 1936, and if and when advisable to contest its constitutionality. It is not likely that the courts will have jurisdiction of a suit to set the act aside until about the time of its effective date.

Another important action taken by the members was the recommendation that the installation of collection and delivery of merchandise freight on railroads locally, jointly and between different freight territories be put in effect as soon as possible under such rate structures and to such an extent as the several territories may work out. It was also recommended that the various rate organizations proceed to revise the rate structure on merchandise freight as will best meet competition in the territories.

The officers of the association were directed to proceed and press to a conclusion as far as possible the unification of terminals. This action was taken following an address by Joseph B. Eastman, Federal Coordinator of Transportation, in which he expressed disappointment at the slow progress being made.

In referring to a proposal to discontinue the district representatives of the Car Service division, J. J. Pelley, president of the association, announced that the proposal would not be placed in effect and that he and M. J. Gormley, executive assistant, would meet with the officers of the shippers advisory boards at the Union League Club, Chicago, on November 19, to discuss ways and means of improving shipper-carrier relations.

J. W. Flintham Dies; Was Secretary of Colorado Utilities Body

John W. Flintham, secretary of the Colorado Public Utilities commission died on November 6, at the age of 61 years. Mr. Flintham had held this office for twenty years.

Erie Coal Properties Under Coal Code

The National Bituminous Coal Commission has announced that the coal mining properties of the Erie Railroad in Central Pennsylvania, which are operated under the name of Northwestern Mining Exchange, have accepted the bituminous coal code. The annual tonnage involved is approximately 1,135,000 tons.

Railway Employment Somewhat Increased in October

The number of employees of Class I railroads as of the middle of October was 1,016,714, according to reports compiled by the Interstate Commerce Commission's Bureau of Statistics. This was an increase of 0.5 per cent as compared with the number in October, 1934, and of 0.81 per cent as compared with September, 1935. With adjustments for seasonal variation the number in October represented 55.4 per cent of the average for 1923-1925.

Temporary Truck-Competitive Rates to Be Extended

The Interstate Commerce Commission has granted special sixth-section authority to both eastern and western trunk-line railroads to continue in effect for another six months their temporary truck-competitive rates which under present tariff provisions would expire on December 31. The special permission allows the roads to make the extension by blanket tariff supplements on 30 days' notice. The railroads stated that some of the tariffs would be allowed to expire but that a majority of the temporary rates would be extended.

Chairman of R. F. C. Says Roads Need Overhauling

Sees readjustments required to meet present conditions and demands of the public

In address before the American Bankers' Association at New Orleans on November 12, Jesse H. Jones, chairman of the Reconstruction Finance Corporation, said that the attitude of the American people toward the railroads is changing but that "on the whole, the railroads must be overhauled to meet present day conditions, and the demands of an ever-exacting public."

Mr. Jones said that much new capital will be required to put them in a condition to handle an increase in traffic and that this is in all probability a government problem. "We will be called upon to make further railroad loans and to assist in the reorganization and financing of some of the roads. We should be a standby for this purpose, as we should be a standby, ready and prepared to assist in the mortgage field, both business and residential." Mr. Jones said in part:

"This changed attitude is characteristic of our people. They are always sympathetic toward the fellow in difficulty. Furthermore, we are beginning to realize that the railroads belong to the public—the policy holders in insurance companies, depositors in savings banks, etcetera. I hold no particular brief for the railroads, but they are entitled to a fair deal by the public, as well as by our legislators; also from their competitors in other forms of transportation.

"This can be had through regulation and supervision of their competitors, similar to that under which they operate. The Old Man of the Sea—their bankers—should be removed from their backs, or subject to stricter regulations as to their rates and charges.

"I am inclined to the opinion that the government can very properly assist in railroad financing, getting their capital requirements at fair, but comparatively low interest rates and at much less financing costs. I would not favor lending unlimited government credit to the roads, nor losing in the lending, but they are so much a part of us as a country, so essential to the national welfare, that the government can afford to help in this respect. Their operating costs are continually on the increase, and sometimes by legislative action. The government regulates their rates, and *should* supervise and scrutinize their management and expenditures more and more.

It is but fair, therefore, that we help them in this way.

"While abuses are much less now than in years past, they should be eliminated as far as is possible to eliminate them. The perpetuation of poor management through small cliques who may be in control of a property should be made impossible. Railroads were built largely by promoters, and while promoters are essential in new developments, some of them have been none too scrupulous, nor too wise, and investors in so many instances have paid the price. It is recognized that railroads are the most essential factor in transportation, but it is nevertheless a fact that on the whole, railroads must be overhauled to meet present day conditions, and the demands of an ever-exacting public. In the overhauling, the investor will take a loss, just as investors in other methods of transportation have taken losses as railroads, highways, and air service have supplanted older methods.

"The time has come when transportation should be treated as a unit, including in that unit, railroads, waterways, highways, and airways. And as the newer and more modern methods are developed, the older must give way. One of our troubles is we have not made proper provision for amortizing the investment in our railroads. When they were earning well, we were entirely too willing to believe that these earnings would go on forever, and proceeded to value them, and to deal in their securities accordingly.

"Upon the whole, railroad management has done unusually well in reducing operating costs as their gross has fallen off. It is surprising that more of them have not come to grief during these lean years when, upon the average, their gross has been cut almost in half.

"If we admit that in the development of our country, most of the railroads that were built were useful, we must now admit that with the advent of highway and air transportation, the constantly increasing use of the Panama Canal and inland waterways, with injustices in certain water rates, we cannot support all railroad mileage. There should be consolidations, and eliminations of unprofitable mileage. Many duplications of service and competing schedules could be eliminated.

"I do not want to be too pessimistic about the future of our railroads, for it would not take a very great increase in revenue to put most of them in the black again. But much new capital will be required to put them in condition to handle the increase. How to get this increased capital is a problem, in all probability a government one. Therefore, the outlook for the investor in railroad securities is none too promising.

"Of one thing I am convinced, railroads are a common problem to us all and will require the attention of our leaders both in and out of Congress, if we are to avoid government ownership. And let me warn you now that we may find many railroad security holders, that ordinarily would oppose this principle, favoring government ownership of the roads in the hope of unloading their investment.

"In leaving the subject of railroads I should like to say with emphasis that renewed ability on the part of railroads to earn and spend, for supplies, betterments, equipment, etcetera, would have a far-reaching effect in improving business in all lines.

Boy Driver Wrecks School Bus in Grade Crossing Accident

Emphasizing the danger of permitting mere children to operate motor vehicles, a summary of the facts developed in connection with a recent crossing accident on the tracks of the Pennsylvania at Petoskey, Mich., centers attention on this menace which is still tolerated in sections of the country. That no lives were lost in this particular instance seems to have been a matter of pure good luck, as the stage was fully set for a typical wholesale grade crossing tragedy.

The accident occurred at the Michigan Street crossing in Petoskey and involved a small truck, equipped as a school bus and driven by a 15-year-old boy, son of the owner of the vehicle, which was carrying 13 other children.

The bus had stopped at a filling station about 100 ft. from the tracks. As it proceeded toward the crossing, the engine was observed to be missing badly. Nevertheless, the juvenile driver kept on and stalled the bus with its front wheels on the rails. A Pennsylvania train was approaching, but not at high speed.

The locomotive bell, which was of the rapid tapper type, was ringing, the whistle was blown twice and the flasher lights protecting the crossing were working.

The engineman threw on the emergency brakes and made the quickest possible stop, but could not avoid striking the bus. Both front wheels and the windshield were broken. Ten of the children were injured, but none of them fatally. Had the speed of the train been higher, or the bus a little farther on the track, a number of occupants would undoubtedly have been killed.

Funds Provided for Study of Pensions and Labor Relations

An allotment of $101,820 to the federal co-ordinator of transportation to enable him to continue investigations concerning railroad labor conditions and relations, particularly in connection with pensions and retirement for railway employees, was announced on November 12 by Public Works Administrator Harold L. Ickes. This allotment was made from the old appropriations for public works construction.

This will provide also for some of the studies which under the railroad retirement act were to be made by the Railroad Retirement Board, which was also authorized to call on other government agencies for assistance. Congress failed to make any appropriation for the expenses of the Retirement Board.

Grade Crossing Programs Approved by President

The President has approved a program submitted by the Department of Public Works and Buildings of Illinois involving $10,307,184 of the funds previously apportioned by the Secretary of Agriculture to Illinois for the elimination of hazards at grade crossings. This exhausts the allocation to the state for this purpose. The funds are to be applied to the following classes of projects: Thirty-one projects on the federal-aid highway system outside of municipalities, involving the elimination of grade crossings by construction of separation structures and re-location of highways, at a total estimated cost of $3,742,934 and involving $3,742,934 federal funds; 21 projects located within municipalities on extensions of the federal-aid system involving the elimination of grade crossings by construction of separation structures and the re-location of highways, at a total estimated cost of $4,086,500, to be paid with federal funds; 14 projects located within municipalities not on extensions of the federal-aid system, involving the construction and reconstruction of grade separation structures, and the re-location of highways to eliminate grade crossings, at a total estimated cost of $1,804,350, to be paid with federal funds; 10 projects located outside of municipalities on secondary or feeder roads, involving the elimination of grade crossings by the construction of grade separation structures and the re-location of highways, at a total estimated cost of $673,400, to be paid with federal funds.

The President has approved a program submitted by the Department of Highways and Public Works of Tennessee, involving $1,034,440 of the funds apportioned by the Secretary of Agriculture to Tennessee for grade crossings. As the total apportionment for the elimination of hazards at grade crossings is $3,903,979, there remains a balance of $2,869,539 to be covered by later programs. The funds are to be applied to three projects on the federal-aid highway system outside of municipalities involving the elimination of railroad grade crossings by the construction or reconstruction of grade separation structures, at a total estimated cost of $281,425; four projects within municipalities on extensions of the federal-aid system, involving the elimination of railroad grade crossings by the construction of grade separation structures, at a total estimated cost of $575,000; and four projects on secondary or feeder roads outside of municipalities involving the elimination of railroad grade crossings by the construction of grade separation structures, at a total estimated cost of $178,015.

The President has approved a program submitted by the State Highway Department of New Mexico involving $657,260 of the funds previously apportioned. As the total apportionment to New Mexico is $1,725,286, there remains a balance of $1,068,026 to be covered by later programs. The funds are to be applied to seven projects on the federal-aid system outside of municipalities involving the elimination of railroad grade crossings by the construction of grade separation structures or the relocation of highways, at a

total estimated cost of $512,660; one project within a municipality on an extension of the federal-aid system, involving the elimination of a railroad grade crossing by the construction of a grade separation structure, at a total estimated cost of $46,300; and two projects on secondary or feeder roads outside of municipalities involving the elimination of railroad grade crossings by the construction of grade separation structures, at a total estimated cost of $98,400.

The President has approved a program submitted by the Department of Highways of Virginia involving $2,384,000 of the funds apportioned. As the total apportionment to Virginia is $3,774,287, there remains a balance of $1,390,287 to be covered by later programs. The funds are to be applied to 34 projects on the federal-aid system outside of municipalities involving the construction or reconstruction of railroad grade separation structures or the re-location of highways, at a total estimated cost of $1,526,500; 10 projects within municipalities on extensions of the federal-aid system involving the construction or reconstruction of railroad grade separation structures, at a total estimated cost of $591,500; and 6 projects on secondary or feeder roads outside of municipalities involving the construction or reconstruction of railroad grade separation structures or the re-location of highways, at a total estimated cost of $266,000.

The President has approved a program submitted by the State Highway Commission of Oklahoma involving $1,364,500 of the funds previously apportioned. As the total apportionment to Oklahoma is $5,004,711, there remains a balance of $3,640,211 to be covered by later programs. The funds are to be applied to 21 projects on the federal-aid system outside of municipalities, involving the elimination of railroad grade crossings by the construction or reconstruction of grade separation structures or the relocation of highways, and installation of signal lights at a total estimated cost of $1,098,500, and 6 projects on secondary or feeder roads outside of municipalities, involving the elimination of grade crossings by the construction or reconstruction of grade separation structures at a total estimated cost of $266,000.

Thus far 275 projects have been approved, with contracts awarded for 121 projects, of which 65 are under construction. The status of the program on November 9 is set forth in the accompanying table.

Status of U. S. Works Program Highway and Grade Crossing Projects for the Week Ending November 9, 1935

State	Grade Crossing Projects: Plans Approved To Date	Contracts Awarded During Week	Contracts Awarded To Date
Alabama	$1,715,000	$250,696	$940,064
Arizona	50,000	.....	39,901
Arkansas	384,000	.....	149,000
California	1,405,000	.....	25,993
Colorado	236,000	.....	190,000
Connecticut	.....	.....	.....
Delaware	.....	.....	.....
District of Columbia	167,000	.....	.....
Florida	603,000	.....	225,713
Georgia	.....	.....	.....
Hawaii	.....	.....	.....
Idaho	431,000	.....	52,000
Illinois	784,000	.....	.....
Indiana	1,857,000	.....	425,033
Iowa	769,000	29,477	572,017
Kansas	.....	.....	.....
Kentucky	878,000	.....	134,312
Louisiana	.....	.....	.....
Maine	79,000	.....	.....
Maryland	.....	.....	.....
Masschusetts	756,000	.....	.....
Michigan	2,980,000	—15,800	*1,251,556
Minnesota	89,000	.....	.....
Mississippi	314,000	.....	.....
Missouri	140,000	.....	.....
Montana	695,000	294,000	470,000
Nebraska	688,000	23,245	349,331
Nevada	355,000	.....	220,518
New Hampshire	.....	.....	.....
New Jersey	.....	.....	.....
New Mexico	143,000	.....	41,000
New York	1,028,000	.....	611,124
North Carolina	443,000	.....	163,877
North Dakota	50,000	.....	39,400
Ohio	.....	.....	.....
Oklahoma	665,000	46,000	356,000
Oregon	307,000	274,000	307,000
Pennsylvania	53,000	.....	.....
Rhode Island	275,000	.....	191,162
South Carolina	408,000	.....	129,360
South Dakota	144,000	.....	64,200
Tennessee	287,000	.....	.....
Texas	377,000	24,000	83,000
Utah	162,000	.....	26,000
Vermont	284,000	.....	.....
Virginia	209,000	.....	.....
Washington	748,000	65,000	106,000
West Virginia	.....	.....	.....
Wisconsin	941,000	.....	295,000
Wyoming	60,000	.....	49,423
Totals	$21,959,000	$990,618	$7,507,984

* Reduction due to withdrawing of an award.

I. C. C. Not Adding to Panel of Trustees

In a letter addressed to Attorney General Cummings, in reply to one suggesting the name of a man to be added to the Interstate Commerce Commission's panel of standing trustees in connection with railroad reorganizations, Commissioner B. H. Meyer stated that as the commission understands the amendment of Section 77 of the bankruptcy act approved on August 27 the district courts are no longer required to appoint trustees from the commission's panel and for that reason the commission, since the amendment became effective, has not considered that it had authority to add names to the panel.

Club Meetings

The Western Railway Club will hold its next meeting on November 18 at the Sherman Hotel, Chicago. C. J. Nelson, superintendent, Chicago Car Interchange Bureau, will present a paper on "Economical Operation of Freight Equipment."

The regular monthly meeting of the New York Chapter, Railway and Locomotive Historical Society, was held on November 8 in Room 1101 of the Engineering Societies building, 29 West Thirty-ninth street, New York. J. V. B. Duer, chief electrical engineer of the Pennsylvania, delivered an illustrated talk on "A Century of Locomotive Development on the Pennsylvania Railroad."

Pennsylvania Speeds Up Florida Train

Beginning January 2 the Florida Arrow, operated by the Pennsylvania between Chicago and Florida East Coast points, will run between Chicago and Miami in three hours less time than previously. The train will leave Chicago at 8:45 p.m., and will arrive in Miami at 8:30 a.m., the second morning, 34 hrs. 45 min.

The Southland, the Pennsylvania's all-year train between Chicago and Florida West Coast points, will, effective December 11, go on a quickened schedule, saving half a day enroute. It will leave Chicago at 11:40 p.m., and it will reach Tampa at 7:30 a.m., and St. Petersburg at 8:30 a.m., the second morning.

New York Railroad Club Annual Dinner December 12

The annual dinner of the New York Railroad Club will be held on Thursday evening, December 12, at the Commodore Hotel, New York, according to an announcement issued this week. The circular promises all who attend "an excellent dinner and the finest entertainment that can be secured." The program will include a complete musical comedy entitled "Railroaders Revels of 1935."

Edward Laterman is general chairman of the General Committee in charge of the affair and is being assisted by two vice-general chairmen—Charles C. Hubbell, and Herbert W. Wolff. Other committees are: Advisory Committee, D. W. Pye, chairman; Dinner Committee, A. N. Dugan, chairman, R. P. Townsend, vice-chairman; Reception Committee, Frank Hedley, chairman, C. E. Hildum and R. F. O'Leary, vice-chairmen; Seating Committee, T. P. O'Brian, chairman, R. G. Richardson, vice-chairman; Attendance Committee, E. A. Jones, chairman; Entertainment Committee, S. F. Pryor, Jr., chairman, Samuel McClurkan, vice-chairman; Publicity Committee, Roy V. Wright, chairman, Bard Browne, vice-chairman.

Railroads and Water Lines Compromise on Liquor Rates

As a result of conferences last week before the Interstate Commerce Commission and the Shipping Board Bureau the transcontinental railroads and the steamship lines operating through the Panama canal have reached a compromise regarding rates on alcoholic liquors by which the water lines are to increase the rate from New Orleans to Pacific ports from $1.175 to $1.30 while the railroad rates will not be reduced. The latter had proposed a reduction in the rates from distillery points in Illinois, Kentucky, and Ohio from $2.25 to $2 and the steamship lines had asked the commission to suspend the reduction, at the same time proposing a similar reduction in their own rates which the railroads asked the Shipping Board Bureau to suspend. After a conference the water lines offered to increase their rates by 12.5 cents.

Inland Waterways Corporation Shows Increase in Traffic

The Inland Waterways Corporation, operating the Federal Barge Lines, has finally attained some results for 1935 which it is willing to make public. After having delayed its annual report for 1934, which showed a net deficit for the year of $920,147, until the showing in the early part of 1935 had shifted "from red to black," the corporation announced on November 11 that its total tonnage from January to September, inclusive, was 1,519,901 tons, as against 1,348,771 for the corresponding months of 1934 and that the total revenue for the first nine months was $4,672,485, as against $3,355,472 for the correspond-

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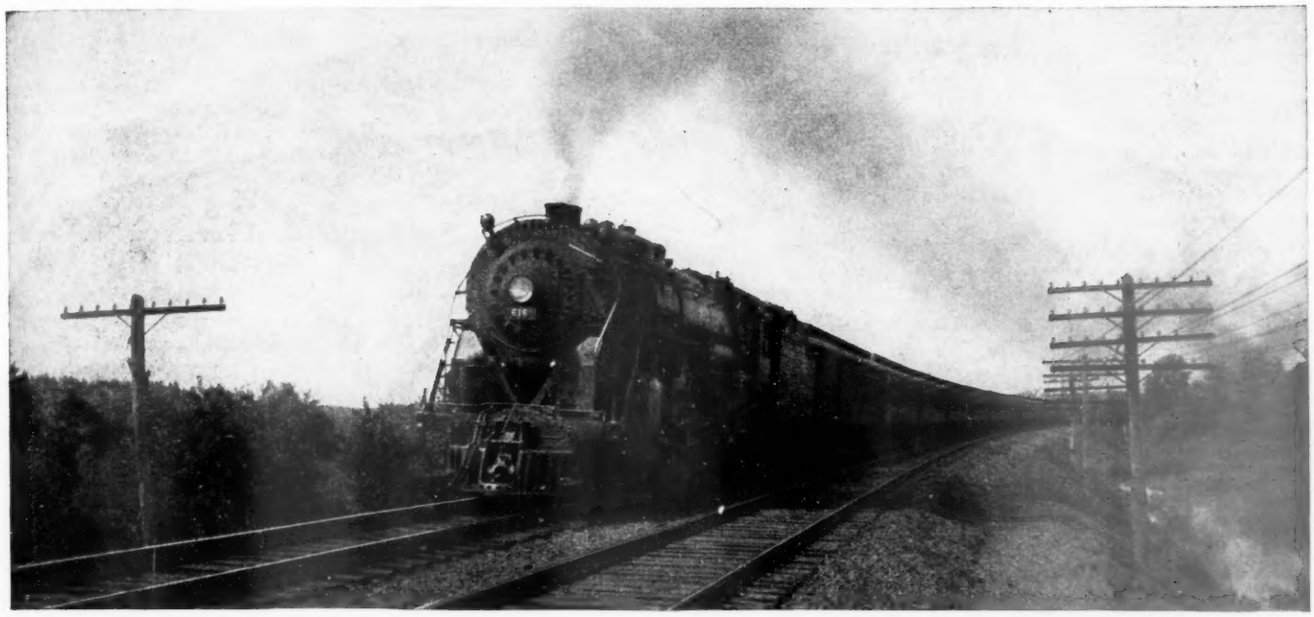
ALMOST Good Enough
WON'T KEEP THE BUSINESS



Passenger traffic is increasing, but passengers demand fast and comfortable service.

Modern power provides quick, smooth acceleration from every stop; high road speeds, and shortens the time between terminals.

Modern power not only has the high drawbar horsepower required for these conditions but also does so at a low cost that leaves a profit from the service.

LIMA LOCOMOTIVE WORKS, INCORPORATED, LIMA, OHIO

LIMA LOCOMOTIVE WORKS INCORPORATED

ing period of 1934. Net income for the nine months, it said, was $454,541, and "the total money received by the corporation in excess of its expenses was $904,554, which includes depreciation of $450,013 which has already been charged in operation under maintenance."

Information Required by I. C. C. of Trustees

The Interstate Commerce Commission has issued a revision of its special rules governing the information required to be furnished to it by persons appointed as railroad trustees by the courts with their petitions for ratification of the appointment by the commission. The revised requirements omit some of the more detailed and intimate information required as to the petitioner's financial relations and provide that the application for ratification shall be made by the appointee instead of by either the debtor or the appointee. As amended, paragraphs (g) and (h) of the order now call for the following information:

> The names and addresses of all persons, partnerships, associations, corporations or other organizations in which the appointee or any member of his immediate family has a financial interest, direct or indirect, beneficial, contingent, or otherwise, together with a description of the nature of such interest, showing whether it is evidenced by stock certificates, notes, bonds or other securities.

Excess Service of Railway Employees

An increase in the number of instances in which railroad employees were held on duty for periods in excess of those provided for by the federal hours of service act in the year ended June 30, 1935, is shown in the annual statistical analysis of carriers' hours of service reports compiled by the Bureau of Safety of the Interstate Commerce Commission. The total number of instances reported for the year was 4,467, as compared with 4,195 in 1934. For 1931 the number was 7,089, for 1932, 4,546, for 1933, 3,202. The number of train service employees continued on duty for longer periods than 16 consecutive hours was 2,419, while 76 were returned to duty after 16 hours' continuous service without having had 10 consecutive hours off duty, 1 was returned to duty after an aggregate service of 16 hours without having had 8 consecutive hours off duty, and 262 were continued on duty after an aggregate service of 16 hours. A total of 1,542 telegraph operators were on duty for more than nine hours in continuously operated day-and-night offices and 167 were on duty more than 13 hours in offices operated only during the daytime.

I. C. C. Inquiring into Control of Van Sweringen Railroads

The Interstate Commerce Commission has instituted inquiries with a view to ascertaining whether it has jurisdiction over the acquisition by the Midamerica Corporation on September 30 of 2,054,492 shares of common stock of the Alleghany Corporation, which in turn holds stock of various railroads in the so-called Van Sweringen system, at the auction sale by New York bankers of collateral securing an unpaid loan to the Van Sweringen interests. It is understood that commission officials feel that the transaction was within its jurisdiction on the ground that the Midamerica thereby obtained control of several railroads but that the company has thus far failed to furnish it with information. Occasion for the inquiry arose when George A. Tomlinson, of Cleveland, a director of the Midamerica, applied for authority to serve as a director of the Fort Worth Belt. In a letter to one of the companies, O. E. Sweet, director of the commission's Bureau of Finance, said that "if it is a fact that Midamerica controls the Alleghany Corporation and thereby controls various railroads in different systems, it will be necessary for the commission to have full information with reference thereto before it can pass intelligently upon Mr. Tomlinson's application."

I. C. C. Finds No Discrimination in Intrastate Rates

The Interstate Commerce Commission has discontinued its proceeding of investigation as to the failure or refusal of the Arkansas Corporation Commission to authorize or permit increases in certain intrastate rates corresponding to the emergency increases authorized for interstate traffic, with a finding that it had not been shown that the state rates caused undue discrimination against interstate commerce. According to the report no evidence was introduced by the railroads to show as to any of the excepted commodities that the action of the Arkansas commission had caused any undue or unreasonable advantage, preference, or prejudice but had merely submitted an estimate that the emergency charges applied to the actual intrastate movements would have amounted to $4,347 for a year.

The commission has also discontinued the proceeding as to Kansas intrastate rates, saying that "in view of the evidence presented showing the relation of the intrastate rates to the interstate rates, the relative volume of movement intrastate versus interstate, the competitive situation with respect to motor truck competition and the competition of coal with natural gas, we are not convinced that the application of the emergency charges intrastate in Kansas on the above-named commodities would actually yield any substantial increase in revenue. Such an inference is not warranted by any competent testimony in the record."

Erie's 100th Birthday Celebrated

The one hundredth anniversary of the breaking of ground for the construction of the Erie was observed by the citizens of Deposit, N. Y., on November 7. It was at Deposit on the morning of November 7, 1835, that James Gore King, president of the then New York & Erie Railroad Company, turned the first spadeful of earth. This spadeful of earth, propelled from the spot in a wheelbarrow pushed by Comptroller Samuel B. Ruggles and closely guarded by the Erie's first Treasurer, Peter G. Stuyvesant, set under way activities that in a few years resulted in the fulfillment of a project, proposed by William G. Redfield in 1829, of a railroad connection between the Atlantic and the Great Lakes, and the later development of what is now the Erie System.

Marking the approximate location where the first earth was turned is a granite monument erected by the Erie to designate its "birth place." It was around this monument that the ceremonies commemorating its one hundredth anniversary, were held. The Booster's Club of Deposit, an organization of young business and professional men, sponsored the celebration, which was attended by officers of the Erie from Cleveland, Ohio, New York and other executive centers. A part of the program was a re-enactment of the scene that took place a century ago, and in commemoration another spadeful of earth was turned by one of the officers of the railroad. Other features of the celebration included a parade in which there was featured the mode of dress and transportation activities of one hundred years ago. Exhibits of modern transportation facilities, both passenger and freight, were provided by the Erie.

Lowest Basis of Passenger Fares to Be Effective in West

The lowest basis of rail passenger fares ever made in any territory for any class of tourist travel will become effective on the western railways next summer to and from Pacific Coast points. For round trips in western territory to or from the Pacific Coast, these new reduced fares will average approximately 2 cents a mile for first-class tickets good in all classes of equipment, 1.6 cents a mile for intermediate-class tickets good in tourist sleepers, and 1⅓ cents a mile for tickets good in day coaches. These reduced rate round-trip tickets will be on sale throughout the western territory from May 15 to October 15, with a return limit of October 31. Corresponding fares will also probably be in effect from eastern and southern territory. Full diverse route and stopover privileges will be allowed under these lowered fares, making it possible for travelers to visit several national parks and the principal cities on the Pacific Coast on their round trips.

In addition, railroads in the Transcontinental, Western and Southwestern Passenger associations will offer new round-trip fares on the western railways to the Black Hills, Colorado, the national parks and the Southwest—Arizona, New Mexico and Mexico City. From June 1 to September 30, with a return limit of October 31, first-class round-trip tickets will be sold from points in western territory to those destinations at an average rate of 2 cents a mile, while for travelers with shorter vacations, tickets with a 21-day return limit will be sold at a rate of approximately 1.65 cents a mile. These tickets also will permit full stopover and diverse route privileges.

Is Government Ownership Inevitable?

The answer to the question "Is Government Ownership Inevitable?" depends wholly on the course of legislation in the immediate future, according to James J. Donohue, general claims attorney of the Louisville & Nashville, who discussed the subject in a recent address at the Western

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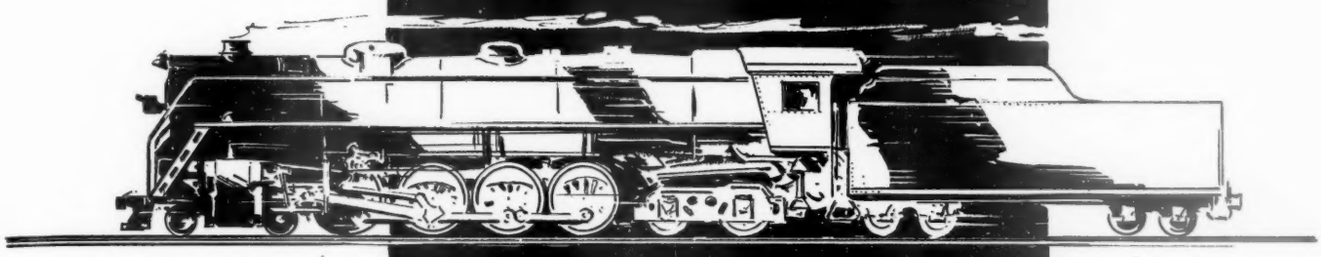
THE BOOSTER
IS AN INTEGRAL PART OF ANY BALANCED MOTIVE POWER UNIT



Two factors are essential for maximum efficiency and economy in any motive power unit:

1. A balance of power between operating and starting ranges to accomplish definite schedules.
2. Minimum costs for fuel and maintenance.

The LOCOMOTIVE BOOSTER provides both.

With a given schedule and load the Booster provides the needed extra power for starting, accelerating and over the "tight places" and permits utilization of smaller cylinders to handle the train at road speeds.

The Locomotive Booster enables a motive power unit of maximum economy and effectiveness in both fuel and maintenance costs.

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NEW YORK CHICAGO MONTREAL

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State Normal School, Bowling Green, Ky.

Mr. Donohue opened with a reference to the "attendant evils" of government ownership, citing in this connection the war experience of the United States and Canada's financial troubles with the Canadian National. The discussion of the problem has been made timely, he said, by the opening of the railroad labor organizations' government-ownership-propaganda headquarters in Washington and by the introduction of Senator Wheeler's government-ownership bill in Congress. The latter, Mr. Donohue thinks, is likely to pursue a policy of "watchful waiting," anticipating that additional lines will go into receivership and that the financial plight of others will be increased by further borrowing from the Reconstruction Finance Corporation.

And while he does not underestimate the influence of organized labor which "is in the saddle and is riding hard" in Washington, Mr. Donohue nevertheless thinks that the latest labor move should not be viewed with alarm—it serves to bring the question of government ownership "in all its ugliness, right to the attention of the electorate at a most auspicious time."

Coming to his discussion of avoiding government ownership through sound legislation on transport matters, Mr. Donohue suggests: (1) Liberalization of railroad regulation; (2) waiver by the government of rate concessions from land-grant roads; (3) discontinuance of the Inland Waterway Corporation's operations; (4) discontinuance of uneconomic federal expenditures on inland waterways; (5) rigid enforcement by states of motor vehicle size and weight limitations; (6) defeat by Congress of "make work" bills such as the full-crew, train-limit and six-hour-day proposals.

Eastman Finds Little Progress as to Charges for Port Services

In an address before the Association of Port Authorities at Houston, Tex., on November 11, Joseph B. Eastman, federal co-ordinator of transportation, who had addressed the same organization 14 months ago regarding the efforts of his organization to induce the railroads to adopt a plan of adequate charges for port terminal services, said that the conditions he had described then and which he believed to be in need of remedy had not changed materially. He said his own opinion on the subject had continually grown stronger and that his assistants had worked diligently but that "all we have so far to show for this work in the nature of concrete results is the accumulation of a large amount of information and experience," although much progress had been made in getting the problem before those who are primarily concerned with it. Many of the state, municipal and private operators have given very good support to these efforts, he said, but by no means all of these operators, and the railroads have certainly not manifested any great enthusiasm over the matter. The Regional Co-ordinating Committees of the railroads have gone on record in favor of such charges, but various practical obstacles have prevented the application of the principle. "The railroads have shown little disposition to make any changes in their charges or practices unless compelled to do so, and their excuse or reason, whichever one may be disposed to regard it, is that these charges and practices are made necessary by the competition in this respect of water carriers, the public and private operators of like facilities at the ports, and to some extent motor truck agencies. In view of the number of conflicting interests involved, however, and the multitude of widely varying situations which require consideration, it may be doubted whether the results which I believe to be very generally desired can be secured without the help of further legislation."

Otto S. Beyer Appointed to Mediation Board

President Roosevelt on November 7 announced the appointment of Otto S. Beyer, who for the past two years has been director of the Section of Labor Relations in the organization of the federal co-ordinator of transportation, as a member of the National Mediation Board, succeeding John F. Carmody. Mr. Beyer has had a long experience in railroad labor relations matters, after an extensive experience in mechanical, experimental, and personnel

Otto S. Beyer

work, and from 1920 to 1933, when he joined Mr. Eastman's staff, he was engaged as a consulting engineer, first in New York and later in Washington. He was born at Woodridge, N. J., on September 18, 1886, and was educated in the public schools, Stevens Preparatory School, and Stevens Institute of Technology, from which he received the M.E. degree in 1907. After graduate work at the Universities of New York and Pennsylvania, he was a machinist apprentice with the E. W. Bliss Company, Brooklyn, N. Y., the Midvale Steel Company, Philadelphia, Pa., and the Erie Railroad. He later became special motive power engineer with the Erie, foreman of a district shop of the Chicago, Rock Island & Pacific, and in 1916 was placed in charge of the railroad engineering experiment work and the locomotive testing laboratory at the University of Illinois. During the World War he participated in the organization of the U. S. School of Military Aeronautics and later he was called into the service of the army, with the rank of captain, to organize and train technical personnel for railway and heavy artillery maintenance. During 1919 he acted with the railroad labor organizations in devising a plan of co-operation with the U. S. Railroad Administration, and he later served as engineering counsel for the shop craft unions and other labor organizations. He was also managing director of the Railway Labor Research Foundation.

President Approves Bridge Program for Inter-American Highway

President Roosevelt has approved a program of bridge construction work on the route of the Inter-American highway in Central America, the U. S. Bureau of Public Roads, in charge of activities on the highway, announces. Congress in June, 1934, appropriated $1,000,000 "to meet such expenses as the President in his discretion may deem necessary to enable the United States to co-operate with the several governments, members of the Pan-American Union, in connection with survey and construction of the proposed Inter-American Highway." As the initial activity under this program, the Bureau of Public Roads has undertaken a program involving construction of several bridges, the estimated expenditure being $340,000, in Panama, Honduras, and Guatemala. Arrangements for construction of these bridges have been approved by the three republics concerned. Similar offers of co-operation made to other interested governments are still under consideration by appropriate authorities of the respective countries.

Under present plans, the United States will furnish surveys, plans, specifications, and estimates for the bridges, all steel or other fabricated material for the superstructure, mechanical equipment, and transportation of materials and equipment to the site of the work. It also will construct the superstructure, supervise all construction, and furnish all inspection and supervision when needed in connection with getting out materials furnished by the other country.

The Inter-American highway route traverses Mexico and the republics of Central America, its termini being Nuevo Laredo, Mexico, across the Rio Grande from Laredo, Texas, and Panama City. About half of its entire length of 3,200 miles lies in Mexico, and the rest in the other six countries. A complete reconnaissance survey of the southern half of the route has been made by the Bureau of Public Roads. The bureau is making further surveys, including a location survey for the final section of the road in Panama, leading to the Costa Rican border. Work on the northern part of the highway will be done by the Mexican government.

Date for Filing Motor Carrier Tariffs Again Postponed

The Interstate Commerce Commission, by Division 5, on November 8 entered an order further extending the effective date of Sections 216, 217, 218, 219, and 223 of the motor carrier act, 1935. These sections deal with the filing and observance of tariffs and schedules showing rates, fares and charges for transportation by

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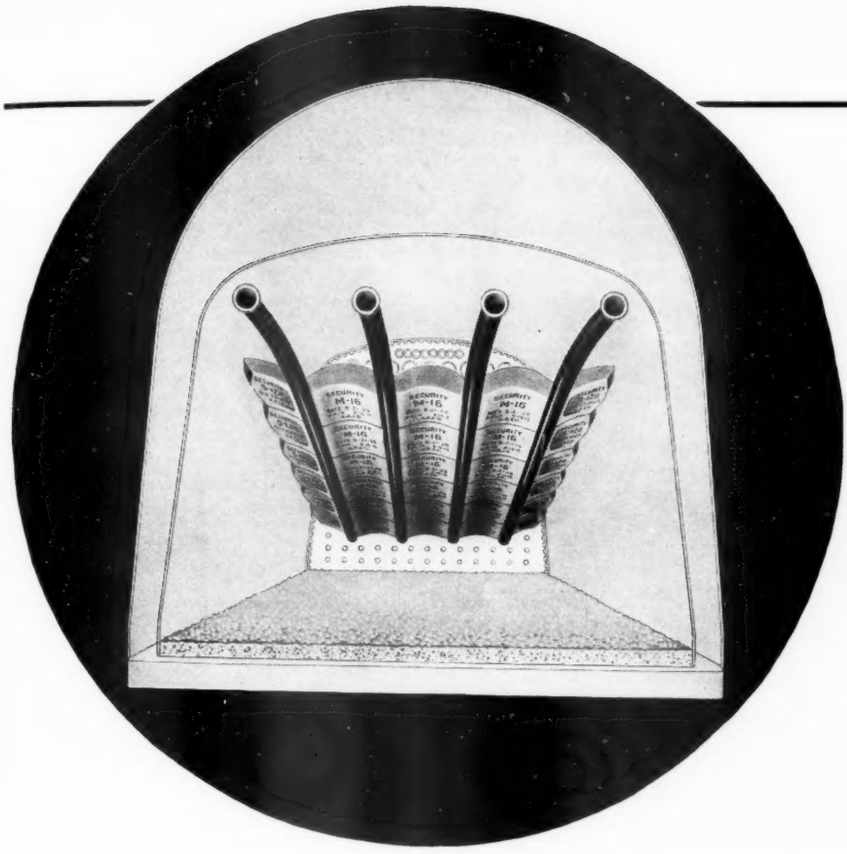

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The Sectional Brick Arch, introduced by the American Arch Company, was the first and only satisfactory arch for locomotive service.

These many years offered opportunity for research work in developing the present standard of the Security Arch. After improvements in design, the supervision of ceramic materials and convenient locations for supply are of equal importance.

To be sure of good Brick from convenient locations American Arch Company supplies the railroads exclusively from the plants listed here.

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NORTH AMERICAN REFRACTORIES CO.
Pennsylvania Kentucky

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DENVER SEWER PIPE & CLAY CO.
Colorado

ATHENS BRICK & TILE CO.
Texas

GLADDING-McBEAN & CO.
California
Washington

DIAMOND FIRE BRICK CO.
Colorado

LOUISVILLE FIRE BRICK WORKS
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DOMINION FIRE BRICK & CLAY PRODUCTS, LTD.
Saskatchewan, Canada

CANADA FIRE BRICK CO., LTD.
Ontario, Canada
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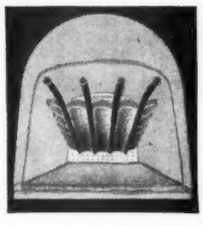

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motor carriers subject to the act, and related matters, as well as the issuance of receipts or bills of lading and the collection of charges. The general effect of this further postponement is to require that tariffs and schedules be filed with the commission on or before January 15, 1936, and to require that the rates, fares and charges for transportation as shown by the tariffs and schedules so filed be effective 30 days later, or on February 14, 1936.

This action, it was explained, was due primarily to the inability of the commission to make necessary preparations incident to the filing of tariffs and schedules and to give the operators additional time in which to compile their tariffs and schedules. Considerable office space will be required to take care of the tariffs and schedules filed by motor carriers and the personnel of the commission engaged in connection therewith. As yet the commission has been unable to secure necessary office space and by reason of this has been delayed in recruiting needed personnel and in installing filing and other equipment.

The commission on November 9 began making public the first applications filed with its Bureau of Motor Carriers for certificates and permits under the "grandfather" clause of the new law which provides for those which were in operation before June 1 and July 1. Number 1 on these applications was assigned to that of Eschenbach & Rodgers, of Scranton, Pa., which was filed by Ted V. Rodgers, president of the American Trucking Associations, Inc., asking for a permit to operate as a contract carrier under a verbal contract with the Great Atlantic & Pacific Tea Company.

The commission has been receiving an increasing number of inquiries from truck operators as to the commission's requirements of annual, periodical, or special reports and systems of accounting, but John L. Rogers, director of the Bureau of Motor Carriers, has advised the trucking association that it will be several months before the classifications of accounts and forms of reports can be issued in their final form, although the subjects are under active consideration.

Low Rates in West Made Permanent

The Western railroads at a meeting in Chicago on November 12, voted to adopt the experimental low rail passenger rates in effect since December 1, 1933, as a permanent basic structure, effective as new tariffs are filed and approved by state commissions after the present tariffs expire March 31. The permanent rates will be 3 cents a mile first class, 2 cents a mile in coaches, 1½ cents a mile in coaches on transcontinental journeys and 2 cents a mile in tourist sleeping cars for transcontinental travel.

Canada to Tackle Truck Problem

A fresh attack upon the tangled problem of motor competition with the railways will be launched at the conference next month in Ottawa between the Dominion and the provincial governments.

Because the licensing of motor vehicles and the tax upon gasoline are both within the provincial power and the provinces are exceedingly reluctant to part with any lucrative source of revenue it is inconceivable that the conference can produce any system of federal control through license and tax, but it is believed probable that before many weeks there will be evolved a central plan whereby a uniformity of operating conditions can be established and, to that extent, of federal control.

More reliance is placed by the railways upon a system of central control over truck operating conditions, such as wages to drivers, hours of work and the number to be employed in the operation of any single vehicle. This sort of regulation is regarded as feasible, and it is believed that the truck operators themselves would welcome regulation that made their operating conditions uniform. More important still, the truck operators would strongly favor some central control over freight tariffs, thus eliminating ruinous competition, but how this can be accomplished where jurisdiction is distributed is a real problem.

The steady loss of freight traffic to the steam railways because of motor truck operation, the continued heavy drain upon the federal treasury to meet Canadian National Railways charges, and the financial problems common both to the federal and the provincial governments have brought the present Dominion Government to a determination to impose some curbs upon that competition and it will be found at the coming conference that the provinces are equally anxious to see that the heavy users of their highways pay a larger share of the cost of maintaining the roads.

Examinations for Motor Carrier Bureau Positions

The United States Civil Service Commission has announced competitive examinations for the positions of district director and district supervisor in the Interstate Commerce Commission's Bureau of Motor Carriers. The former carries an annual salary of $5,600 and the latter $3,800.

Competitors, whose applications must be on file with the Civil Service Commission in Washington by December 2, will not be required to report for examination but will be rated 70 per cent on education, experience and fitness and 30 per cent on a thesis to be filed with the application. Before appointment, however, those attaining eligible ratings will be required to report for an oral examination.

Among the necessary qualifications the following are listed:

District Director.—They must have had the experience described in one of the following paragraphs or in some time-equivalent combination thereof:

(1) Not less than four years of experience in an important administrative or legal capacity with a motor carrier (which may include either a common carrier by motor vehicle or a contract carrier by motor vehicle) operating not less than fifteen vehicles.

(2) Not less than four years of important administrative or legal experience with a regulatory body of a State having jurisdiction over motor carriers.

(3) Not less than four years of experience in important administrative or legal capacity with a Chamber of Commerce, Board of Trade, or other similar organization as head of the traffic bureau having to do with motor carriers.

(4) Not less than four years of experience in important administrative or legal capacity with an association of motor carriers.

(5) Each year of experience in an important administrative or legal capacity with a code authority having jurisdiction over motor carriers will be accepted as the equivalent of two years of the experience described above in making up the required four years of experience.

District Supervisor.—They must have had the experience described in one of the following paragraphs or in some time-equivalent combination thereof:

(1) Not less than three years of experience in an administrative or legal capacity with a motor carrier (which may include either a common carrier by motor vehicle or a contract carrier by motor vehicle) operating not less than fifteen vehicles.

(2) Not less than three years of administrative or legal experience with a regulatory body of a State having jurisdiction over motor carriers.

(3) Not less than three years of experience in administrative or legal capacity with a Chamber of Commerce, Board of Trade, or other similar organization as head of the traffic bureau having to do with motor carriers.

(4) Not less than three years of experience in an administrative or legal capacity with an association of motor carriers.

(5) Each year of experience in an administrative or legal capacity with a code authority having jurisdiction over motor carriers will be accepted as the equivalent of two years of the experience described above in making up the required three years of experience.

The thesis to accompany the application must be of not less than 2,000 words on one of the following subjects:

1. The respective advantages of motor carriers and rail carriers in the transportation of passengers and different classes of property.
2. The desirability in the public interest of regulation by the Federal Government of Motor Carriers engaged in interstate commerce.
3. Possible ways in which motor carriers and rail carriers can operate in co-operation to mutual advantage.

P. & S. Division Selects Committees

The Purchasing and Stores division of the Association of American Railroads has selected its subjects for consideration during the year and the personnel of each committee. The committees are as follows:

General Committee—1935-1936: C. B. Tobey (chairman) general storekeeper, L. V.; E. A. Clifford, general purchasing agent, C. & N. W.; F. S. Austin, assistant purchasing agent, N. Y. C.; J. L. Bennett, purchasing agent, C. of Ga.; W. G. Black, vice-president, C. & O.; E. Harty, assistant general storekeeper, S. P.; J. C. Kirk, assistant general storekeeper, C. R. I. & P.; L. P. Krampf, supply agent, M. P.; E. J. Lamneck, purchasing agent, Penna.; A. C. Mann, vice-president, I. C.; C. H. Murrin, general storekeeper, L. & N.; G. E. Scott, purchasing agent, M-K-T.; H. M. Smith, general storekeeper, N. P.; A. L. Sorensen, manager of stores, Erie; G. H. Walder, purchasing agent, C. M. St. P. & P.; L. B. Wood, general storekeeper, T. & N. O.

Advisory Committee: D. C. Curtis, chief purchasing officer, C. M. St. P. & P.; U. K. Hall, general purchasing agent, U. P.; A. S. McKelligon, general storekeeper, S. P.; A. W. Munster, vice-president, B. & M.; H. C. Pearce, assistant to vice-president, C. G. W.; H. E. Ray, general storekeeper, A. T. & S. F.; F. D. Reed, purchasing agent, C. R. I. & P.; G. E. Scott, purchasing agent, M-K-T; L. C. Thomson, manager of stores, C. N.; C. E. Walsh, general purchasing agent, Penna.; C. D. Young, vice-president, Penna.

Special Purchasing Committee: A. C. Mann (chairman), vice-president, I. C.; W. C. Bower, vice-president, N. Y. C.; C. E. Walsh, general purchasing agent, Penna.; A. W Munster, vice-president, B. & M.; D. C. Curtis, chief purchasing officer, C. M. St. P. & P.; E. A. Clifford, general purchasing agent, C. & N. W.; J. L. Bennett, purchasing agent, C. of Ga.; G. E. Scott, purchasing agent, M-K-T.

Subject 2—Material Classification: F. J. McMahon (chairman), general storekeeper, N. Y. C.; F. G. Drieling, division storekeeper, N. P.; E. A. Ernst, traveling storekeeper, C. R. I. & P.; G. A. Goerner, traveling storekeeper, C. B. & Q.; A. J. Munn, district storekeeper, G. N.; W. D. Riach, chief clerk to general storekeeper, A. T. & S. F.; H. J. Smith, district storekeeper, S. P.; E. Harty (chairman ex-off.) assistant general storekeeper, S. P.

Subject 3—Classification, Handling and Sale of Scrap: J. J. Collins (chairman), general foreman, scrap and reclamation plant, Erie; E. J. Becker, district storekeeper, S. P.; D. D. Canavan, general foreman reclamation plant, B. & M.; L. F. Duvall, assistant general storekeeper, A. C. L.; W. R. Gordon, superintendent reclamation and scrap, C. N.; T. J. Hegeman, supervisor reclamation, C. B. & Q.; J. V. Miller, assistant general storekeeper, C. M. St. P. & P.; W. J. Sidey, supervisor scrap and reclamation, L. V.; L. L. Studer, district storekeeper, M. P.; E. G. Walker assistant general purchasing agent, A. T. & S. F.; James Young, assistant purchasing agent, Penna.; J. C. Kirk, (chairman ex-off.) assistant general storekeeper, C. R. I. & P.

Subject 3A—General Reclamation: I. C. Bon

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THE SUPERHEATER COMPANY

NEW YORK ELESCO CHICAGO

Repair Part Purchases

The members of the Purchases and Stores Division committee on Subject XXVIII, "Purchase of Special Devices and Commodity Purchases," are to be commended for their thoroughgoing attitude in regard to the purchase of repair parts, as expressed again in their report submitted at the recent annual meeting, especially wherein they recognize the dangers involved in purchasing repair parts for special devices from competitive concerns instead of from the original manufacturers of the complete devices.

The committee recommends that such purchases should be made only after a thorough investigation as to the suitability of the competitive repair part, because so many low-priced substitutes offered are found more expensive in the long run due to shorter life, involving more frequent renewals with attendant repair costs. Also, because of possible damage to expensive equipment that might result from the application of unreliable substitute parts.

Purchasing officers recognize the value of buying repair parts from the manufacturer of the device and are inclined to favor him if at all possible. Intelligent purchasing on the part of the railroads, however, cannot countenance exorbitant prices at any time, but to casually change to substitute parts only because of what appears to be exorbitant prices, and without investigation of the suitability of the substitute part, is by far the most dangerous and expensive course.

Railway Purchases and Stores — Sept. 1935 (page 413)

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Peoples Gas Bldg.

REPRESENTATIVE OF AMERICAN THROTTLE COMPANY, INC.

(chairman), superintendent of reclamation, Wab.; E. R. Casey, supervisor reclamation, U. P.; A. L. Prentice, manager scrap and reclamation, N. Y. C.; W. P. Stewart, supervisor of scrap, I. C.; J. C. Kirk (chairman ex-off.), assistant general storekeeper, C. R. I. & P.

Subject 4—Comparisons of Material stock Reports and Material Store Expenses: J. F. Riddle (chairman), statistician, Penna.; O. A. Donagan, general storekeeper, B. & M.; M. E. Baile, assistant supply agent, M. P.; O. L. Browne, assistant to purchasing agent, A. C. L.; W. S. Morehead, general storekeeper, I. C.; A. L. Sorensen (chairman ex-off.), manager of stores, Erie.

Subject 4A—Joint Committee on Store Expenses—Div. VI Representatives: J. F. Riddle (chairman), statistician, Penna.; M. E. Baile, assistant supply agent, M. P.; O. A. Donagan, general storekeeper, B. & M.

Subject 5—Forest Products: J. R. McGrenera (chairman), general tie and timber inspector, A. T. & S. F.; C. M. Burpee, research engineer, D. & H.; G. C. Campbell, tie and timber agent, M. P.; James Deery, assistant purchasing agent, Penna.; F. W. Holt, assistant purchasing agent, Erie; L. W. Kistler, superintendent treating plants, St. L.-S. F.; J. E. McNellev chief tie and lumber supervisor, A. C. L.; G. H. Robison, purchasing agent, O. W. R. R. & N.; C. C. Warne, purchasing agent, N. Y. C.; H. M. Smith (chairman ex-off.), general storekeeper, N. P.

Subject 6—Purchasing and Storekeeping for Highway Motor Vehicles: R. C. Harris (chairman), general storekeeper, Penna.

Subject 9—Fuel: L. L. White (chairman), vice president, Erie; D. C. Curtis, chief purchasing officer, C. M. St. P. & P.; P. A. Hollar, fuel purchasing agent, Penna.; J. M. Johnston, fuel agent, M-K-T; T. H. Lauderdale, general purchasing agent, M. P.; F. D. Reed, purchasing agent, C. R. I. & P.; H. T. Shanks, general purchasing agent, L. & N.; F. J. Carroi, fuel assistant, N. Y., N. H. & H.; A. C. Mann (chairman ex-off.), vice president, I. C.

Subject 10—Forecasting Requirements: C. B Hall (chairman), store manager, Penna.; M. E. Towner, general purchasing agent, W. Md.; G. O. Beale, assistant to vice president, C. & O.; G. J. Hunter, traveling material supervisor, A. T. & S. F.; A. B. Lackey, division storekeeper, Sou.; J. L. Bennett (chairman ex-off.), purchasing agent, C. of Ga.

Subject 11—Pricing and Inventory: V. N. Dawson (chairman), district storekeeper, B. & O.; U. K. Hall, general purchasing agent, U. P.; C. A. G. Blomquist, stores accountant, C. of Ga.; F. I. Foley, general storekeeper, N. Y., N. H. & H.; C. H. Murrin (chairman ex-off.), general storekeeper, L. & N.

Subject 12—Purchasing Organization and Records: H. M. Rainie (chairman), B. & M.; G. M. Betterton, purchasing agent, S. P.; John Eaton, assistant to general purchasing agent, C. P.; W. E. Evans, purchasing agent, G. T. W.; J. W. Hagerty, general supervisor, office of purchasing agent, Penna.; A. J. Neault, assistant purchasing agent, C. & N. W.; A. A. Taylor, assistant purchasing agent, M. P.; F. S. Austin (chairman ex-off.), assistant purchasing agent, N. Y. C.

Subject 13—Stationery and Printing: O. B. Mills (chairman), stationery storekeeper, Penna.; J. T. Van Horn, stationer, M. P.; G. E. Perrot, stationery supervisor, S. A. L.; M. L. Tynan, general purchasing agent, Ry. Exp. Agcy.; G. H. Walder (chairman ex-off.), purchasing agent, C. M. St. P. & P.

Subject 14—Stores Department Fire Prevention: J. W. Watkins (chairman), assistant to general storekeeper, L. V.

Subject 16—Simplification and Standardization: A. G. Follette (chairman), general material supervisor, Penna.; B. T. Adams, district storekeeper, I. C.; H. Crouse, general storekeeper, T. & P.; W. R. Culver, general storekeeper, C. & O.; J. L. Irish, assistant general storekeeper, U. P.; R. D. Long, general storekeeper, C. B. & Q.; C. A. Nichols, assistant general storekeeper, N. P.; J. W. Wade, general storekeeper, N. & W.; L. B. Wood (chairman ex-off.), general storekeeper, S. P.

Subject 17—Safety: J. G. Warnecke (chairman), division storekeeper, I. C.

Subject 18—Terminal Storekeeping: C. W. Yeamans (chairman), purchasing and supply agent, C. & W. I.

Subject 19—Loading and Handling: D. Corcoran (chairman), general storekeeper, C. & N. W.

Subject 21—Commissary Supplies: L. V. Hyatt (chairman), commissary purchasing officer, M. P.

Subject 27—New Ideas and Economies: J. T. Kelly (chairman), general storekeeper, C. M. St. P. & P.; C. K. Reasor, assistant manager stores, Erie; J. S. Genther, general storekeeper, L. & N. E.; F. J. McGuinness, superintendent of stores, D. & H.; C. L. Wakeman, general storekeeper, Wab.; E. A. Clifford (chairman ex-off.), general purchasing agent, C. & N. W.

Subject 28—Special Devices: G. W. Leigh (chairman), purchasing agent, M. St. P. & S. S. M.; P. L. Grammer, assistant purchasing agent, Penna.; J. F. Duffy, stores representative, Erie; A. N. Laret, assistant to chief purchasing officer, St. L.-S. F.; A. S. McKelligon general storekeeper, S. P.; W. G. Black (chairman ex-off.), vice president, C. & O.

Subject 29—Exchange of Surplus Material: W. H. Morris (chairman), general storekeeper, Read.; C. S. White, general purchasing agent, N. Y. C.; W. S. Galloway, purchasing agent, B. & O.; H. Hayes, general storekeeper, G. N.; E. S. Jamieson, assistant to general purchasing agent, U. P.; H. E. Ray, general storekeeper, A. T. & S. F.; E. J. Lamneck (chairman ex-off.), purchasing agent, Penna.

Subject 31—Material Guarantees: W. A. Clem (chairman), purchasing agent, Read.; W. J. Adams, requisition marker, Penna.; E. A. Jones, purchasing agent, L. V.; L. L. King, assistant purchasing agent, I. C.; J. E. McMahon, assistant purchasing agent, C. St. P. M. & O.; G. E. Scott (chairman ex-off.), purchasing agent, M-K-T.

Subject 32—Adoption of Recommended Practices: P. L. Grammer (chairman), assistant purchasing agent, Penna.

Subject 33—Buildings and Facilities: E. H. Hughes (chairman), general storekeeper, K. C. S.; S. A. Hayden, general storekeeper, M-K-T; E. W. Peterson, general storekeeper, B. & A.; L. P. Krampf (chairman ex-off.), supply agent, M. P.

Joint Committee on Inspection of Materials—Div. VI Representatives: A. C. Mann (chairman), vice president, I. C.; E. A. Clifford, general purchasing agent, C. & N. W.; F. D. Reed, purchasing agent, C. R. I. & P.; G. H. Walder, purchasing agent, C. M. St. P. & P.; C. E. Walsh, general purchasing agent, Penna.

* * * *

Courtesy: German Tourist Info. Office, N. Y.

An Electric Train of the German Railroads in the Bavarian Alps

Equipment and Supplies

FREIGHT CARS

THE NEW YORK CENTRAL is having 1500 cars repaired in its own shops at Avis, Pa., East Buffalo, N. Y., and Beech Grove, Ind.

THE ST. LOUIS-SAN FRANCISCO is reported to be preparing bids on repair parts for 500 hopper cars and contemplates re-equipping 600 box cars with steel roofs.

THE READING is preparing to construct at its own shops in Reading, Pa., 25 all-steel caboose cars which will be equipped with Duryea underframes.

THE MISSOURI PACIFIC is inquiring for 500 box cars of 40 tons' capacity. The company's rehabilitation program calls for the purchase of 4,000 freight cars and repairs to present equipment.

THE MISSOURI-KANSAS-TEXAS is reported to be considering the purchase of 500 stock cars, 300 gondola cars of 40 tons' capacity, 200 gondola cars of 50 tons' capacity, and scrapping 15 locomotives, 25 passenger cars and 600 freight cars.

IRON AND STEEL

THE NORTHERN PACIFIC has ordered 15,000 tons of rails, dividing the order among the Bethlehem Steel Company, the Carnegie-Illinois Steel Corporation and the Colorado Fuel & Iron Company.

THE NASHVILLE, CHATTANOOGA & ST. LOUIS has ordered 5,050 tons of rails, 1,000 kegs of spikes, 400 kegs of bolts, 70,400 tie plates and 7,400 rail joints from the Tennessee Coal, Iron & Railroad Company.

AIR CONDITIONING

THE SOUTHERN PACIFIC has authorized $1,100,000 for its 1936 air-conditioning program. Work has already started and upon its completion substantially all principal trains will be fully air-conditioned. In addition, arrangements are being made for an extension of the air-conditioning of Pullman cars operated in Southern Pacific trains.

MISCELLANEOUS

ILLINOIS CENTRAL.—The American Steel Foundries has received orders for roller bearing units necessary to equip all of the trailer trucks and for brakes for all of the trucks for the Illinois Central high-speed streamlined train now being constructed by the Pullman-Standard Car Manufacturing Company.

THE NEW YORK CENTRAL on October 21 increased the number of men at its East Buffalo, N. Y., shops to bring the total up to 408 men at those shops, and also increased the number of men at the Beech Grove, Ind., shops to a total of 192. Later there will be a number of additional men employed at the Avis, Pa., shops.

Continued on next left-hand page

NOTCHING UP OR DOWN?

THERE is a certain point in business volume, under which any concern must operate in the red. But past this point, any increase in business volume should be reflected in a commensurate profit, provided, of course, that the operating ratio does not go up disproportionately. Quite often, if not always, such a rise in the operating ratio is due to obsolete equipment. . . One can go only just so far and so long in making the old equipment do. Past a certain point, increased business means only an opportunity for just getting by — in other words, just prolonging the inevitable. . . So watch that operating ratio. Is it notching-up, or notching-down? You might think and honestly believe that your equipment is good enough. Your operating ratio, going-up or going-down, will be your check. . . Incidentally, it is becoming almost a daily occurrence for our newspapers to report some aggressive industrialist as actively preparing for a return of prosperity. One corporation alone recently announced a program calling for the expenditure of over 100,000,000 dollars. . . Leadership has always gone to concerns having the most efficient equipment.

AMERICAN LOCOMOTIVE COMPANY

ALCO

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Supply Trade

The Roller-Smith Company, New York, has appointed the **Harris-Green Company,** Farmers Bank building, Pittsburgh, Pa., as its district sales agent for Western Pennsylvania, Eastern Ohio and West Virginia.

Otis B. Duncan, representing the **Northwestern Motor Company,** the **Electric Products Company,** the **Johnston Manufacturing Company,** the **Universal Power Corporation** and the **Railroad Products Company,** has moved his office to 37 West Van Buren street, Chicago.

J. Homer Platten has been appointed executive assistant to the president of the **American Car & Foundry Company.** The appointment was announced this week by Charles J. Hardy, president of the A. C. F. Mr. Platten recently resigned as assistant to comptroller of the Westinghouse Electric & Manufacturing Company.

The Klasing Car Brake Company, Chicago, has concluded an arrangement with the **Vermilion Malleable Iron Company** of that city, giving the latter company exclusive rights to manufacture and sell Klasing hand brakes throughout the United States, Canada and Mexico. District sales representatives will be located in New York, Philadelphia, Pa., Washington, D. C., Boston, Mass., Richmond, Va., Roanoke, St. Paul, Minn., St. Louis, Mo., Denver, Colo., and San Francisco, Cal.

OBITUARY

Langley Ingraham, manager of railway sales for Lowe Brothers Company, Dayton, Ohio, died on September 30 at his home in Easton, Md., after an illness of several months.

Construction

CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC.—This company has awarded contracts to the T. W. Snow Construction Company, Chicago, for the construction of water treating plants at Lawson, Mo., Manilla, Iowa, and Rodney and Sioux Falls, S. D., at a total approximate cost of $35,000.

MISSOURI PACIFIC.—Plans have been submitted by this railroad to the Texas State Highway department for an underpass to carry San Pedro avenue, San Antonio, Tex., under two tracks of the railroad. The structure will have two sidewalk spans and a clear roadway span of 42 ft. The main span will consist of two-ply deck plate-girders with a wrought iron deck. This structure, which is estimated to cost about $75,000, is to be included in the WPA program for the elimination of grade crossings.

Financial

ATLANTIC & NORTH CAROLINA.—*Operation.*—This company has applied to the Interstate Commerce Commission for a certificate authorizing it to resume operation of its line from Morehead City, N. C., to Goldsboro, 95.8 miles, which has been leased to and operated by the Norfolk Southern but for which the latter has applied for a certificate authorizing the abandonment of operation.

BALTIMORE & OHIO.—*R. F. C. Loan.*—The Interstate Commerce Commission has extended until August 1, 1939, the time of payment of a loan of $31,610,400 by the Reconstruction Finance Corporation to this company which matures November 21.

BRATTLEBORO & WHITE HALL.—*Abandonment.*—An application has been filed with the Interstate Commerce Commission for authority to abandon the line of the West River from South Londonderry, Vt., to Brattleboro, 36 miles.

CHICAGO & NORTH WESTERN.—*Compensation of Trustee.*—The Interstate Commerce Commission, Division 4, has issued an order approving $25,000 as the maximum compensation to be paid to Charles P. Megan, trustee.

DENVER & SALT LAKE.—*Bonds.*—This company has applied to the Interstate Commerce Commission for authority to issue $2,500,000 of first mortgage 4 per cent bonds to be used to provide funds for the redemption of a like amount of 6 per cent bonds which it is proposed to call at 105, possibly by pledging them as collateral for a loan from the Reconstruction Finance Corporation or a bank.

LONG ISLAND.—*New Director.*—George V. McLaughlin, president of the Brooklyn (N. Y.) Trust Company, has been elected a director of this company.

LOUISVILLE & NASHVILLE.—*Abandonment of Trackage Rights.*—The Interstate Commerce Commission has authorized this company to abandon operation under trackage rights over the line of the Interstate R. R. between Norton, Va., and Miller Yard, 17.5 miles.

LOUISVILLE & NASHVILLE.—*Acquisition.*—This company and the South East & St. Louis have applied to the Interstate Commerce Commission for authority for the conveyance of the property of the latter to the L. & N., which owns its stock and operates the property under lease.

MAINE CENTRAL.—*Acquisition.*—The Interstate Commerce Commission has authorized the acquisition by this company of the properties of the Eastern Maine, which owns 18.76 miles of line from Bangor, Maine, to Bucksport operated by the Maine Central under a 999-year lease dated May 1, 1883. The stockholders of the Eastern Maine in August accepted the Maine Central's offer to purchase its properties and franchises for $125,000, equivalent to $62.50 a share for the outstanding capital stock. Of the 2,000 shares, 1,364 were held by the Samoset Company, a subsidiary of the Maine Central.

NEW YORK, NEW HAVEN & HARTFORD.—*Additional Trustees.*—The Federal court for Connecticut has appointed Professor Winthrop M. Daniels of Yale University and J. L. Loomis, president of the Connecticut Mutual Life Insurance Company, as trustees of this railroad, in addition to Howard S. Palmer, president, whose appointment as trustee was announced in the *Railway Age* last week.

NEW YORK, NEW HAVEN & HARTFORD.—*Statement to Stockholders.*—President Palmer, in a letter to the stockholders of this company explaining its trusteeship application, said, among other things, the following:

In 1929 and 1930 the company retired $29,649,000 of funded debt, $22,149,000 of which came from cash and current assets and $7,500,000 from bank loans.

The company has borrowed $20,175,000 during the depression to cover in part deficits in income, equipment trust installments, additions and betterments to the property, etc. It also obtained $5,250,000 in connection with the government's unemployment program for repairs to equipment and for new rail, most of which is still unlaid.

Total funded and unfunded debt (including all bank and government loans, etc.) at the present time amounts to $283,094,000, as compared with $282,270,000 on January 1, 1929, and $317,245,000 on January 1, 1923.

Fixed charges and guarantees in 1935 will total $19,600,000 (approximately the same as year 1929, i. e., $19,250,000), notwithstanding that gross revenues will be $70,000,000, which is less than half of the gross revenues in 1929.

In 1935 it is expected that 74 per cent of fixed charges, including guarantees, will be earned, as compared with 66 per cent earned in 1934.

Gross revenues for the first nine months of 1935 total $52,277,021, an increase of $190,023 over the previous year. Operating expenses were $38,489,923, a decrease of $1,179,358 under last year. Net railway operating income was $6,143,173, an increase over last year of $1,839,656. Non-operating income was $5,105,420, or a decrease compared with last year of $736,186. Fixed charges were $13,867,465, or a decrease of $8,538 under last year. Guarantees were $842,579, the same as last year. Deficit after guarantees amounted to $3,461,451, an improvement of $1,112,008. The operating ratio for September was 72.30, as compared with 78.41 last year, and for the nine months it was 73.63, compared with 76.16 last year. This has been accomplished without neglecting the maintenance of the property based upon present traffic volume. With improvement in traffic, maintenance expenses will increase.

It will be observed that there was an improvement in net railway operating income of $1,839,656, notwithstanding an increase of $1,450,000 in rates of pay and cost of fuel and after deducting the credit adjustment on account of the pensions.

Practically all of the company's available collateral was taken by the government in 1934 as security for loans obtained at that time. The government has not felt justified, under the R. F. C. Act, in approving an additional loan based on the collateral that it now has.

The upturn in business during the late spring of this year seemed to justify the hope that the company might be able to recover as it did after 1923, at which time a succession of deficits and an enormous government debt had left it in a precarious condition. But, with the downward trend of business last summer, the company's revenues declined, and its obligations, principally taxes, now due or soon to become due, are so large that they cannot be met without further borrowing.

Although during the past two weeks gross revenues show a substantial increase over the same period of last year, there is no assurance that this marked upturn is of a permanent nature. The uncertain factors which will have an important influence in the year 1936 have a very vital bearing on the New Haven's problem. It is faced with a possible substantial reduction in passenger fares; a large increase in pension payments; increase in taxes due to the Social Se-

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1881 **Union Switch & Signal Co.** 1935

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curity Act; substantial increase in its coal bill due to the Guffey Act. It must spend a large amount of money in changing some 7,000 freight cars from arch bar trucks to cast steel side frames, in order to keep them in interchange service and to meet the Association of American Railroads' order, which becomes effective January 1, 1938.

While the management believes there should be a substantial increase in gross revenues during the year 1936, forecasts from different quarters are so varied that there is no assurance that the upturn will be sufficient to take care of all of the company's requirements.

The New Haven management has every confidence in the fundamental soundness of the southern New England territory, through which the New Haven operates. It is convinced that with a reasonable return of general business activity New England will benefit materially and the New Haven will obtain its full share of traffic resulting from increased business. Further, the New Haven management is convinced that in a very large measure the improved earnings which will accrue to the New Haven with increased general business activity can in time be translated into improved net income, as a result of the increased efficiency and improvement in organization, methods and practices which have been and are now being developed.

Careful thought has been given to the possibility of some so-called "voluntary" moratorium or adjustment of the obligations of the company without resorting to judicial proceedings. A study of the problem in the light of the experience of other railroads with even less complicated financial structures than the New Haven has convinced the management that such an adjustment could not be accomplished and that the diverse interests of numerous and widely scattered holders will be best served under a Section 77 proceeding. No effort will be spared to consummate a fair and equitable reorganization, just to all concerned, as quickly as may be consistent with the best interests of all concerned.

NORFOLK SOUTHERN.—*Separation of Atlantic & North Carolina.*—Effective November 16, the Atlantic & North Carolina will take over the control and operation of the properties of that company, extending from Goldsboro, N. C., to Morehead City, which has heretofore been operated as a part of the Norfolk Southern.

ST. LOUIS-SAN FRANCISCO.—*Equipment Trusts.*—Trustees of this company have announced their willingness to purchase at not more than face value, without interest subsequent to maturities, the following past due equipment trust obligations of the company: Equipment trust certificates, series DD, which matured April 1, 1934, together with interest coupons which matured on that date from all outstanding series DD certificates; equipment trust certificates, series CC, which matured May 15, 1934, together with interest coupons which matured on that date, from all outstanding series CC certificates. Coupons matured July 15, 1934, from all outstanding equipment gold notes, series 71-A to 71-E, inclusive, dated January 15, 1920.

SOUTHERN PACIFIC.—*Abandonment.*—The Interstate Commerce Commission has authorized this company to abandon 11.1 miles of its "West Side" line between Cheshire, Oreg., and Transfer.

Dividends Declared

West Jersey & Seashore.—6 Per Cent Guaranteed.—$1.50, semi-annually, payable December 2 to holders of record November 15.

Average Prices of Stocks and of Bonds

	Nov. 13	Last week	Last year
Average price of 20 representative railway stocks..	36.48	36.50	35.81
Average price of 20 representative railway bonds..	71.81	72.30	73.92

Railway Officers

Edward M. Durham, Jr., Named Chief Executive Officer of Rock Island

Edward M. Durham, Jr., has been appointed chief executive officer of the Chicago, Rock Island & Pacific, with headquarters at Chicago. Mr. Durham has been senior executive assistant of the Missouri Pacific since the appointment of trustees for that company in 1933, prior to which time he was senior vice-president. Pending reorganization of the Rock Island, the line is being operated by trustees, who made the appointment of Mr. Durham, with the approval of the Reconstruction Finance Corporation.

Strauss Portrait

Edward M. Durham, Jr.

A native of Memphis, Tenn., Mr. Durham was born on October 23, 1875, and was educated at Lehigh university, from which he graduated in 1898. An engineer by training, Mr. Durham spent several years in the pursuit of his chosen profession before entering active railroad service. In 1896-97 he was engaged with the United States War Department on hydrographic surveys on the Ouachita river, following which he served for several years as recorder for the Deep Waterways Commission of the State of New York. Mr. Durham entered railway service in 1899, as a transitman with the Chicago & North Western, leaving this company in the following year to go with the Southern as an assistant engineer. With this company he was promoted successively through the positions of resident engineer, principal assistant engineer, assistant chief engineer, and chief engineer. While connected with the Southern, Mr. Durham also served for two years as valuation engineer of the Atlanta, Birmingham & Atlantic (now the Atlanta, Birmingham & Coast) and as executive general agent of the Southern. In 1920, Mr. Durham joined the United States Railway Administration as manager of the department of way and structures, being appointed director of the division of liquidation claims in 1923. In 1924 he returned to railway service as assistant to the president of the Missouri Pacific, being appointed vice-president of this line in 1926. He was made senior vice-president in the following year.

OPERATING

G. H. Baker, inspector in the office of the manager of passenger transportation of the New York Central System, with headquarters at New York, has been appointed assistant to manager passenger transportation, with the same headquarters.

Marion Streett, yardmaster on the Fort Wayne division of the Pennsylvania, has been appointed assistant trainmaster on the Grand Rapids division, with headquarters at Grand Rapids, Mich., succeeding **Claude Crawford,** who has been transferred to the Columbus division, with headquarters at Richmond, Ind., to replace **J. H. Ball,** who has been transferred to Columbus, Ohio, on the same division, where he succeeds **J. P. Shea. M. W. Witt,** freight agent, with headquarters at Logansport, Ind., has been appointed supervising agent-assistant trainmaster-division operator on the Toledo division, with headquarters at Toledo, Ohio, to succeed **E. G. DeLong.**

H. T. Frushour, whose appointment as superintendent of the Long Island was noted in the *Railway Age* of November 2, was born in Logansport, Ind., on February 17, 1882, and was graduated from Purdue University. During the summer recesses while a student at Purdue, Mr. Frushour secured temporary employment with the Pennsylvania, as rodman and locomotive fireman. In September, 1902, after graduation, he entered this road's service as rodman on the Logansport division. He was advanced to assistant on an engineering corps in May, 1907, and in 1910 was transferred in the same capacity to another part of the road. Mr. Frushour was appointed division engineer on the Cleveland and Pittsburgh division (now called

H. T. Frushour

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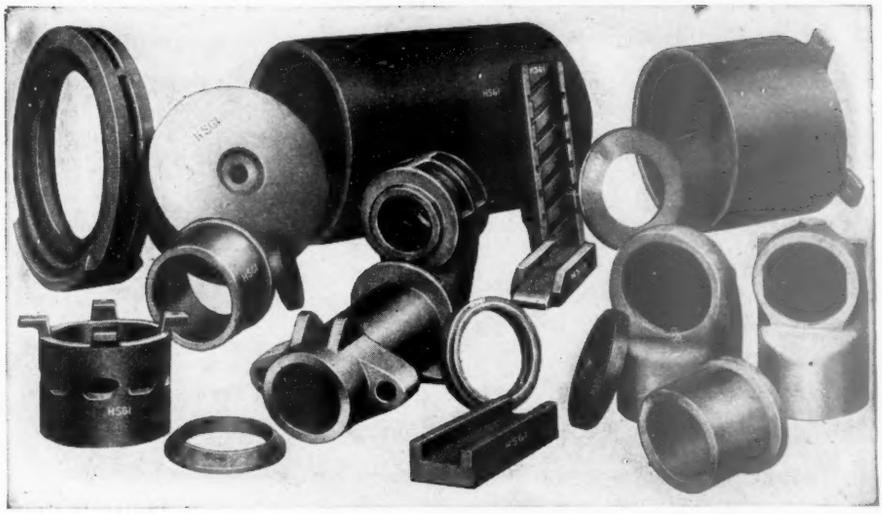

INSURES

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the Cleveland division) in January, 1927. He was appointed superintendent of the Monongahela division at Uniontown, Pa., in July, 1928, and superintendent of the Erie & Ashtabula division at New Castle, Pa., in June, 1929. In September, 1932, he became superintendent of the St. Louis division at Terre Haute, Ind., and superintendent of the Eastern division at Pittsburgh, Pa., in July, 1933, which position he held until his recent appointment as superintendent of the Long Island, with headquarters at Jamaica, N. Y.

TRAFFIC

C. H. Pistor has been appointed assistant general freight agent of the Texas & Pacific, with headquarters at Dallas, Tex.

J. E. Peck has been appointed traffic manager and superintendent and **R. T. Morris** has been appointed general agent of the Tonopah & Goldfield, with headquarters at Tonopah, Nev.

Roy E. Smith, assistant general freight agent on the Northern Pacific, has been appointed assistant to the general traffic manager, with headquarters as before at St. Paul, Minn.

A. B. Smith, general agent for the Litchfield & Madison, has been appointed assistant traffic manager, with headquarters as before at Chicago. **George J. Cashel,** commercial agent, has been appointed assistant traffic manager at Chicago, succeeding **William W. Baum,** deceased.

L. R. Challoner, assistant general freight and passenger agent on the Northern Pacific, whose appointment as assistant freight traffic manager, with headquarters at St. Paul, Minn., was noted in the *Railway Age* of November 9, has been connected with this company continuously for 25 years. He was born on June 14, 1891, at Bismarck, N. D., and performed his first service for the Northern Pacific as

L. R. Challoner

a water boy with a construction gang in 1903. After completing his public school education in 1910, Mr. Challoner entered the service of this railroad as a chainman in the engineering department. Later he served successively as a freight trucker at the Jamestown, N. D., transfer, and as a clerk and rate clerk, with the same headquarters. In 1914 Mr. Challoner was sent to Bismarck as cashier and in 1916 he was advanced to chief clerk, with the same headquarters. In the following year he was appointed chief clerk in the Billings, Mont., local freight office and in 1919 he was made freight supervisor on freight claim prevention work at Jamestown. In 1924 Mr. Challoner was appointed agent at Fargo, N. D., and two years later he was advanced to assistant general freight agent at St. Paul. In 1928, he was appointed assistant general freight and passenger agent at Helena, Mont., where he was located at the time of his recent appointment as assistant freight traffic manager, effective November 16.

MECHANICAL

W. C. Vanhook, assistant car foreman of the Interstate Railroad Company, has been appointed general car foreman, with headquarters at Andover, Va., succeeding **M. D. Wampler,** deceased.

SPECIAL

Miss Avis Lobdell, who has been connected with the Union Pacific in various capacities for several years, has been appointed special representative of the executive vice-president, with headquarters at Omaha, Neb. In her new capacity, Miss Lobdell will ride the trains of the Union Pacific and of other railroads, studying and reporting on matters pertaining to the comfort of women and children and will inspect the company's dining cars, hotels, restaurants and other properties with which the public come in contact.

OBITUARY

O. C. Swan, assistant general livestock agent of the Chicago, Burlington & Quincy, Lines West of the Missouri river, with headquarters at Denver, Colo., was killed on November 4 in an automobile accident near Wamego, Kan.

Harry G. Clark, who has been executive assistant to the trustees of the Chicago, Rock Island & Pacific since the appointment of trustees in 1933, prior to which time he was vice-president, died on November 12 at his home in a suburb of Chicago. Mr. Clark had been in railway service continuously for 37 years. He was born on July 8, 1875, at Leavenworth, Kan., and was educated in civil engineering at the University of Kansas, from which he graduated in 1898. He entered railway service on September 15, 1898, as a chairman on the Atchison, Topeka & Santa Fe. After a short period of service with the Santa Fe, he left this company to go with the Chicago, Burlington & Quincy, serving as a rodman on construction and a transitman on location. In 1900, Mr. Clark became resident engineer on the Western division of the Choctaw, Oklahoma & Gulf (now part of the Chicago, Rock Island & Pacific), later serving as division engineer of the same division. Later Mr. Clark served also as division engineer of the Panhandle and Arkansas divisions of the Rock Island. In 1905 he was appointed district engineer of the Choctaw district of the latter company, which position he held until 1909, when he was made trainmaster of the Arkansas division, later being transferred to the Oklahoma division. In 1912 he was made assistant to the vice-president

Harry G. Clark

and six years later he was appointed chief engineer. After a year in the latter capacity, Mr. Clark was appointed assistant to the president, which position he held until 1927, when he was made vice-president.

J. C. Cooke, comptroller of the Norfolk & Western, with headquarters at Roanoke, Va., died on October 27 of pneumonia, after a brief illness. Mr. Cooke was born on November 24, 1867, in Gloucester County, Va., and was educated at Gloucester Academy. He began his railroad career as a clerk in the office of the superintendent of car service of the Philadelphia & Reading in November, 1888. In June, 1890, he entered the service of the Norfolk & Western at Roanoke as a clerk. Nine years later he was promoted to assistant clerk in charge of the waybill bureau. In April, 1907, he became clerk in charge of the waybill bureau. Mr.

J. C. Cooke

Cooke was made chief clerk to the auditor of receipts in January, 1911, and was advanced to auditor of freight receipts in May, 1924, and general auditor in July, 1930. Mr. Cooke was promoted to comptroller in March, 1933.

Operating Revenues and Operating Expenses of Class I Steam Railways in the United States

Compiled from 145 Monthly Reports of Revenues and Expenses Representing 149 Class I Steam Railways

FOR THE MONTH OF SEPTEMBER, 1935 AND 1934

Item	United States		Eastern District		Southern District		Western District	
	1935	1934	1935	1934	1935	1934	1935	1934
Average number of miles operated	237,430	238,820	58,905	59,039	45,119	45,365	113,406	134,416
Revenues:								
Freight	$249,925,875	$220,493,959	$100,545,353	$85,882,148	$46,957,616	$41,345,927	$102,422,906	$93,265,884
Passenger	30,819,961	30,633,744	17,995,685	18,161,706	3,654,214	3,647,492	9,170,062	8,824,546
Mail	7,221,976	7,203,429	2,813,194	2,768,134	1,257,426	1,239,195	3,151,356	3,196,100
Express	3,664,738	4,238,025	2,164,619	1,833,560	894,704	701,990	605,415	1,702,475
All other transportation	8,535,279	6,570,222	3,386,936	3,078,106	760,252	650,789	4,388,091	2,841,327
Incidental	6,170,127	5,791,515	3,072,125	2,890,204	797,592	765,311	2,300,410	2,136,000
Joint facility—Cr.	774,690	792,173	253,338	259,336	155,472	159,852	365,880	372,985
Joint facility—Dr.	152,432	183,413	48,034	42,453	17,951	19,700	86,447	121,260
Railway operating revenues	306,960,214	275,539,654	130,183,216	114,830,741	54,459,325	48,490,856	122,317,673	112,218,057
Expenses:								
Maintenance of way and structures	36,763,263	31,502,165	13,924,612	12,178,626	6,309,105	5,931,400	16,529,546	13,392,139
Maintenance of equipment*	55,449,400	50,509,476	23,802,411	21,287,327	10,667,325	9,704,524	20,979,664	19,517,625
Traffic	7,664,568	7,386,363	2,909,109	2,857,266	1,457,719	1,386,772	3,297,740	3,142,325
Transportation	103,830,294	96,659,365	46,381,599	42,947,665	16,576,298	15,699,487	40,872,397	38,012,213
Miscellaneous operations	2,588,241	2,357,022	1,172,439	1,097,706	254,647	229,117	1,161,155	1,030,199
General	12,131,903	15,094,885	5,360,270	6,022,914	1,992,012	2,478,039	4,779,621	6,593,932
Transportation for investment—Cr.	387,370	289,219	69,429	87,881	38,163	16,167	279,778	185,171
Railway operating expenses	218,040,299	203,220,057	93,481,011	86,303,623	37,218,943	35,413,172	87,340,345	81,503,262
Net revenue from railway operations	88,919,915	72,319,597	36,702,205	28,527,118	17,240,382	13,077,684	34,977,328	30,714,795
Railway tax accruals	20,819,369	19,853,824	9,225,953	8,365,232	4,190,753	3,926,609	7,402,663	7,561,983
Uncollectible railway revenues	120,096	69,410	85,788	29,805	10,123	10,192	24,185	29,413
Railway operating income	67,980,450	52,396,363	27,390,464	20,132,081	13,039,506	9,140,883	27,550,480	23,123,399
Equipment rents—Dr. balance	7,704,885	7,608,481	3,501,057	3,393,917	86,217	204,202	4,117,611	4,010,362
Joint facility rent—Dr. balance	2,916,225	3,074,456	1,730,739	1,713,787	175,360	334,716	1,010,126	1,025,953
Net railway operating income	*a* 57,359,340	*b* 41,713,426	22,158,668	15,024,377	12,777,929	8,601,965	22,422,743	18,087,084
Ratio of expenses to revenues (per cent)	71.03	73.75	71.81	75.16	68.34	73.03	71.40	72.63
* Includes:								
Depreciation	16,009,181	15,450,761	7,085,319	6,834,968	3,121,979	2,922,961	5,801,883	5,692,832
Retirements	176,283	353,129	74,724	60,102	31,817	182,558	69,742	110,469
Maintenance of equipment before depreciation and retirements	39,263,936	34,705,586	16,642,368	14,392,257	7,513,529	6,599,005	15,108,039	13,714,324
Net railway operating income before depreciation and retirements	73,544,804	57,517,316	29,318,711	21,919,447	15,931,725	11,707,484	28,294,368	23,890,385

FOR NINE MONTHS ENDED WITH SEPTEMBER, 1935 AND 1934

Average number of miles operated	237,833	239,110	58,960	59,082	45,235	45,434	133,638	134,594
Revenues:								
Freight	$2,022,521,877	$1,986,698,271	$872,381,603	$851,094,197	$399,221,837	$391,790,479	$750,918,437	$743,813,595
Passenger	267,070,518	260,879,479	155,266,902	156,456,818	34,783,360	33,441,980	77,020,256	70,980,681
Mail	66,955,603	66,588,633	25,751,456	25,800,797	11,872,726	11,693,953	29,331,421	29,093,883
Express	38,580,683	39,985,114	15,344,208	16,805,957	8,613,114	7,949,570	14,623,361	15,229,587
All other transportation	60,454,094	56,466,587	29,965,771	29,239,613	5,785,356	5,289,132	24,702,967	21,937,842
Incidental	50,968,316	48,371,884	26,625,220	25,738,942	7,459,426	6,976,099	16,883,670	15,656,843
Joint facility—Cr.	7,185,171	6,881,834	2,223,828	2,146,748	1,636,324	1,596,868	3,325,019	3,138,218
Joint facility—Dr.	1,814,835	1,698,794	488,758	448,117	156,704	152,026	1,169,373	1,098,651
Railway operating revenues	2,511,921,427	2,464,173,008	1,127,070,230	1,106,834,955	469,215,439	458,586,055	915,635,758	898,751,998
Expenses:								
Maintenance of way and structures	297,379,821	279,662,506	113,506,786	111,859,802	55,828,311	53,654,637	128,044,724	114,148,067
Maintenance of equipment†	500,384,833	485,828,725	220,384,426	218,581,609	95,442,442	91,414,658	184,557,965	175,832,458
Traffic	70,611,779	66,980,705	26,564,095	25,428,483	13,471,121	12,700,809	30,576,563	28,851,413
Transportation	922,186,553	868,789,399	424,878,843	407,581,685	154,110,024	144,806,720	343,197,686	316,400,994
Miscellaneous operations	22,493,823	20,103,044	10,284,903	9,778,300	2,720,486	2,348,725	9,488,434	7,976,019
General	106,101,173	115,932,036	48,702,214	49,545,071	18,584,870	19,603,040	38,814,089	46,783,925
Transportation for investment—Cr.	2,486,619	2,210,820	504,836	640,261	303,452	227,765	1,678,331	1,342,794
Railway operating expenses	1,916,671,363	1,835,085,595	843,816,431	822,134,689	339,853,802	324,300,824	733,001,130	688,650,082
Net revenue from railway operations	595,250,064	629,087,413	283,253,799	284,700,266	129,361,637	134,285,231	182,634,628	210,101,916
Railway tax accruals	182,653,401	188,055,281	76,280,690	78,215,737	37,559,604	37,297,803	68,813,107	72,541,741
Uncollectible railway revenues	818,032	851,268	412,811	449,017	94,749	138,398	310,472	263,853
Railway operating income	411,778,631	440,180,864	206,560,298	206,035,512	91,707,284	96,849,030	113,511,049	137,296,322
Equipment rents—Dr. balance	63,278,564	68,315,735	30,333,019	33,663,058	3,254,827	4,927,668	29,690,718	29,725,009
Joint facility rent—Dr. balance	26,505,385	27,279,344	15,135,606	15,087,433	2,568,072	3,316,552	8,801,707	8,875,359
Net railway operating income	*c* 321,994,682	*d* 344,585,785	161,091,673	157,285,021	85,884,385	88,604,810	75,018,624	98,695,954
Ratio of expenses to revenues (per cent)	76.30	74.47	74.87	74.28	72.43	70.72	80.05	76.62
† Includes:								
Depreciation	143,746,395	139,400,258	63,043,689	61,459,541	27,969,874	26,346,367	52,732,832	51,594,350
Retirements	1,370,732	3,646,041	560,411	871,170	316,653	1,150,466	493,668	1,624,405
Maintenance of equipment before depreciation and retirements	355,267,706	342,782,426	156,780,326	156,250,898	67,155,915	63,917,825	131,331,465	122,613,703
Net railway operating income before depreciation and retirements	467,111,809	487,632,084	224,695,773	219,615,732	114,170,912	116,101,643	128,245,124	151,914,709

a Includes credits to General Expenses in the amount of $316,168 on account of reversal of charges previously made for liability under the Railroad Retirement Act.

b Includes charges to General Expenses in the amount of $2,758,922 on account of accruals for liability under the Railroad Retirement Act.

c Includes credits to General Expenses in the amount of $7,284,425 on account of reversal of charges previously made for liability under the Railroad Retirement Act.

d Includes charges to General Expenses in the amount of $5,575,523 on account of accruals for liability under the Railroad Retirement Act.

Compiled by the Bureau of Statistics, Interstate Commerce Commission. Subject to revision.

Table of Operating Statistics of Railways begins on next left-hand page

Freight Operating Statistics of Large Steam Railways—Selected Items for the Month of September,

Region, road, and year	Average miles of road operated	Train-miles	Locomotive-miles: Principal and helper	Locomotive-miles: Light	Car-miles: Loaded (thousands)	Car-miles: Per cent loaded	Ton-miles (thousands): Gross Excluding locomotives and tenders	Ton-miles (thousands): Net Revenue and non-revenue	Average number of locomotives on line: Serviceable	Unserviceable	Per cent unserviceable	Stored
New England Region:												
Boston & Albany	1935	373	116,283	122,001	8,556	2,930	69.7	151,195	53,477	58	34	36.5	18
	1934	402	117,166	121,066	7,876	2,898	68.1	150,097	50,051	58	42	41.7	14
Boston & Maine	1935	1,971	243,932	269,341	24,895	8,605	74.1	441,363	174,601	97	174	64.1	9
	1934	2,016	240,974	268,748	27,349	8,228	69.4	441,029	166,297	110	172	60.9	11
N. Y., New Hav. & Hartf.	1935	2,049	301,989	368,985	18,481	10,541	69.1	556,307	216,253	182	117	39.0	10
	1934	2,049	304,962	371,809	17,472	9,598	67.3	514,736	196,118	217	135	38.5	42
Great Lakes Region:													
Delaware & Hudson	1935	835	196,463	264,320	28,868	6,997	68.7	417,056	202,562	244	28	10.5	155
	1934	848	191,007	254,164	27,380	6,291	61.9	392,088	176,489	246	29	10.5	155
Del., Lack. & Western	1935	992	320,240	353,670	46,168	10,727	68.4	606,244	239,601	153	89	36.7	40
	1934	992	326,087	362,803	47,613	10,472	66.9	595,192	229,584	184	73	28.5	45
Erie (incl. Chi. & Erie)	1935	2,305	653,334	687,761	44,098	28,084	66.4	1,695,780	627,059	270	203	42.9	65
	1934	2,304	646,644	678,234	53,917	27,780	63.3	1,699,848	626,232	322	170	34.5	88
Grand Trunk Western	1935	1,007	197,314	199,942	2,486	5,505	64.4	330,453	123,275	72	68	48.6	..
	1934	1,007	176,295	178,102	1,676	4,613	60.7	279,521	94,591	67	71	51.6	..
Lehigh Valley	1935	1,321	329,798	348,202	34,736	10,882	67.7	658,372	273,712	130	160	55.1	13
	1934	1,335	358,268	373,955	32,708	10,609	63.9	650,639	256,281	185	126	40.6	33
New York Central	1935	10,919	2,269,798	2,387,791	137,769	78,065	62.3	4,916,161	2,074,616	850	668	44.0	137
	1934	10,931	2,243,182	2,351,366	138,802	76,055	60.3	4,804,934	1,949,502	885	750	45.9	122
N. Y., Chi. & St. Louis	1935	1,661	403,021	406,117	6,282	14,267	66.5	832,610	315,465	136	46	25.5	46
	1934	1,661	453,078	457,552	4,662	14,610	62.0	857,962	304,792	132	49	27.2	34
Pere Marquette	1935	2,090	325,983	342,195	5,137	8,448	62.5	538,065	216,680	110	44	28.5	4
	1934	2,101	292,381	299,728	2,525	7,051	61.4	443,616	172,425	112	39	25.7	20
Pittsburgh & Lake Erie	1935	234	62,810	64,638	24	2,595	60.3	220,216	124,964	34	39	53.3	10
	1934	234	61,716	62,668	.....	2,429	54.6	213,807	115,505	35	37	51.4	11
Wabash	1935	2,435	505,109	513,411	11,159	16,192	66.8	920,368	328,844	154	166	51.9	33
	1934	2,445	496,445	505,734	11,113	14,913	63.6	878,947	296,767	162	170	51.1	42
Central Eastern Region:													
Baltimore & Ohio	1935	6,319	1,279,932	1,585,996	167,839	40,023	64.0	2,671,557	1,212,680	673	631	48.4	94
	1934	6,263	1,208,508	1,472,935	165,922	37,692	61.2	2,498,247	1,086,131	803	522	39.4	242
Central of New Jersey	1935	684	135,570	154,365	28,499	4,664	62.7	313,814	151,946	70	86	55.3	19
	1934	690	127,016	141,753	26,460	4,259	58.9	291,481	136,268	77	92	54.3	24
Chicago & Eastern Illinois	1935	939	154,795	155,024	2,485	3,733	65.1	236,460	102,364	49	60	54.7	7
	1934	939	159,052	159,831	2,605	3,699	63.1	232,265	96,407	50	59	54.2	7
Elgin, Joliet & Eastern	1935	434	81,926	83,027	1,141	2,075	62.3	156,518	78,011	55	32	37.1	4
	1934	446	70,750	72,575	1,093	1,609	58.8	122,765	58,430	63	25	28.6	15
Long Island	1935	393	24,350	25,546	12,214	224	52.7	17,219	6,841	30	21	40.8	3
	1934	396	25,984	26,928	12,730	294	54.2	21,747	8,633	29	28	49.3	1
Pennsylvania System	1935	10,009	2,412,510	2,718,865	289,328	89,916	65.3	5,789,370	2,603,464	1,292	1,139	46.9	235
	1934	9,998	2,287,028	2,550,186	287,298	83,748	63.0	5,467,578	2,417,542	1,532	933	37.9	427
Reading	1935	1,452	340,686	371,091	42,428	10,164	62.9	717,614	344,555	265	101	27.7	93
	1934	1,454	356,518	386,059	41,094	10,128	59.5	729,510	342,903	277	105	27.6	95
Pocahontas Region:													
Chesapeake & Ohio	1935	3,050	759,286	796,405	31,234	32,621	56.1	2,734,938	1,473,229	398	96	19.5	97
	1934	3,075	804,093	848,712	36,262	35,684	54.7	3,051,076	1,636,071	440	114	20.5	119
Norfolk & Western	1935	2,145	559,376	584,763	26,663	22,452	60.3	1,785,031	923,986	323	57	15.0	100
	1934	2,162	560,483	585,297	27,090	22,569	59.1	1,821,642	938,247	384	40	9.4	144
Southern Region:													
Atlantic Coast Line	1935	5,146	427,529	428,058	6,056	9,085	65.8	468,072	166,794	298	113	27.4	55
	1934	5,146	435,209	435,913	6,004	8,831	64.7	457,004	158,760	328	131	28.5	87
Central of Georgia	1935	1,886	215,471	216,810	3,416	5,199	73.4	264,387	102,639	95	46	32.6	..
	1934	1,886	199,606	200,679	3,136	4,566	70.0	241,632	92,189	98	43	30.5	..
Illinois Central (incl. Y. & M. V.)	1935	6,587	1,354,921	1,362,939	25,274	33,564	64.3	2,128,370	897,003	639	222	25.8	51
	1934	6,580	1,333,544	1,343,540	25,468	31,933	60.4	2,088,296	842,476	606	323	34.8	16
Louisville & Nashville	1935	5,045	927,862	1,010,719	25,784	22,031	60.7	1,527,446	739,136	318	266	45.6	23
	1934	5,049	904,159	972,927	23,763	20,286	58.6	1,409,100	659,023	316	300	48.7	22
Seaboard Air Line	1935	4,295	371,768	377,857	3,461	9,089	70.4	489,171	189,098	173	111	39.1	25
	1934	4,296	403,605	410,371	3,411	9,062	64.0	514,048	186,050	195	86	30.6	23
Southern	1935	6,599	1,064,535	1,079,210	18,558	25,635	70.6	1,351,404	529,113	524	287	35.4	58
	1934	6,599	991,734	1,006,793	17,474	23,041	66.9	1,239,458	459,646	569	285	33.4	73
Northwestern Region:													
Chi. & North Western	1935	8,428	961,874	1,013,774	28,391	25,759	61.7	1,627,058	566,698	557	207	27.1	121
	1934	8,443	1,055,334	1,127,655	26,634	27,317	59.2	1,682,240	560,040	585	235	28.7	164
Chicago Great Western	1935	1,458	229,863	231,825	11,089	7,369	63.9	447,833	169,558	63	34	34.9	4
	1934	1,463	266,065	266,547	11,243	8,221	58.4	516,200	175,828	61	35	36.6	2
Chi., Milw., St. P. & Pac.	1935	11,119	1,353,044	1,437,181	61,698	37,447	60.3	2,401,481	978,901	525	133	20.2	102
	1934	11,154	1,375,136	1,451,312	66,463	36,213	60.0	2,237,507	852,961	543	339	38.5	127
Chi., St. P., Minneap. & Om.	1935	1,641	214,282	224,768	8,895	4,922	64.5	306,050	133,079	107	32	23.3	37
	1934	1,644	231,883	242,310	10,239	5,095	63.5	305,147	120,139	124	35	22.3	48
Great Northern	1935	8,244	986,988	996,226	34,181	35,586	57.7	2,512,132	1,105,792	443	157	26.2	33
	1934	8,302	872,176	880,482	26,227	29,519	60.3	1,886,821	760,873	441	156	26.1	73
Minneap., St. P. & S. St. M.	1935	4,273	368,271	373,804	4,008	9,069	67.5	536,412	244,462	135	18	11.9	..
	1934	4,280	370,631	377,411	3,010	8,701	61.7	504,614	199,930	119	41	25.6	1
Northern Pacific	1935	6,421	749,431	829,721	64,844	24,204	62.6	1,523,546	635,500	348	101	22.6	4
	1934	6,410	695,547	760,706	53,545	22,273	64.1	1,295,836	499,967	358	106	22.8	15
Oreg.-Wash. R. R. & Nav.	1935	2,097	205,670	218,546	15,810	5,402	64.2	336,465	137,096	100	37	27.0	10
	1934	2,152	182,273	189,838	12,816	4,652	65.7	270,939	104,256	86	40	31.6	13
Central Western Region:													
Alton	1935	921	189,535	199,892	1,878	4,373	64.1	272,009	101,817	52	40	43.8	2
	1934	921	203,003	213,681	1,698	4,320	58.1	278,430	93,951	57	37	38.9	6
Atch., Top. & St. Fe (incl. G.C. & S.F. & P. & S.F.)	1935	13,260	1,631,942	1,751,628	73,812	45,920	63.4	2,837,899	962,064	624	366	37.0	110
	1934	13,316	1,691,899	1,788,926	70,836	48,564	61.9	3,000,028	977,765	664	356	34.9	141
Chicago, Burl. & Quincy	1935	8,971	1,274,688	1,336,304	49,907	34,305	60.9	2,076,175	868,438	452	102	18.4	3
	1934	9,059	1,336,206	1,394,682	42,562	34,556	57.9	2,093,273	813,298	450	114	20.2	2
Chi., Rock I. & Pac. (incl. Chi., Rock I. & Gulf)	1935	8,297	974,908	997,523	5,810	22,419	65.5	1,326,303	527,604	369	272	42.4	37
	1934	8,304	1,078,300	1,099,105	7,449	24,562	61.3	1,501,458	571,066	389	233	37.4	77
Denv. & Rio Gr. Western	1935	2,584	329,365	359,418	36,960	8,484	65.7	509,528	193,548	167	43	20.5	6
	1934	2,636	343,223	376,174	39,216	8,746	63.3	518,045	195,265	180	43	19.3	3
Los Angeles & Salt Lake	1935	1,240	154,758	177,677	26,524	4,720	67.3	265,982	97,655	74	20	21.5	8
	1934	1,224	164,892	189,206	29,163	4,808	63.5	285,375	108,326	72	22	23.0	3
Oregon Short Line	1935	2,495	421,093	443,857	31,348	11,068	63.2	672,634	242,853	134	48	26.3	8
	1934	2,484	350,201	365,651	24,072	9,270	60.4	581,187	208,562	131	51	28.1	13
Southern Pac.—Pac. Lines	1935	8,599	1,220,650	1,321,479	149,821	38,862	63.3	2,452,003	855,635	539	248	31.4	112
	1934	8,607	1,129,524	1,221,484	138,767	36,795	62.9	2,289,103	791,568	559	288	34.1	148
Union Pacific	1935	3,590	1,176,240	1,204,861	53,999	39,326	59.4	2,496,484	838,791	306	101	24.8	34
	1934	3,768	1,191,477	1,215,401	46,966	38,487	58.3	2,401,993	771,218	318	100	24.0	43
Southwestern Region:													
Mo.-Kans.-Texas Lines	1935	3,282	355,560	359,114	5,301	10,067	65.1	600,085	228,645	120	76	38.7	32
	1934	3,282	360,585	363,851	4,744	9,734	60.7	585,337	204,337	116	81	41.1	30
Missouri Pacific	1935	7,202	1,140,821	1,177,149	24,488	30,899	62.8	1,932,142	753,166	384	150	28.1	104
	1934	7,330	1,183,092	1,216,998	27,769	32,086	60.6	2,004,608	754,119	412	141	25.4	115
St. Louis-San Francisco	1935	4,888	650,629	657,610	8,904	14,745	63.6	894,867	362,399	373	73	16.4	117
	1934	5,041	667,306	675,124	8,941	14,658	60.5	890,418	337,282	384	79	17.1	128
St. Louis Southw. Lines	1935	1,767	196,856	205,094	2,699	5,000	73.5	270,332	109,600	87	28	24.2	17
	1934	1,798	202,713	207,365	2,752	5,199	66.6	288,212	108,595	91	31	25.2	12
Texas & New Orleans	1935	4,417	462,396	465,845	8,067	10,654	66.5	627,846	238,953	227	65	22.2	54
	1934	4,433	473,694	473,764	5,002	11,073	62.9	661,089	242,443	242	60	19.8	71
Texas & Pacific	1935	1,945	220,718	220,718	1,141	6,991	67.4	404,732	150,065	141	80	36.3	68
	1934	1,945	231,116	231,116	1,651	7,528	67.9	429,173	159,528	146	84	36.5	80

Compiled by the Bureau of Statistics, Interstate Commerce Commission. Subject to Revision.

1935, Compared with September, 1934, for Roads with Annual Operating Revenues Above $25,000,000

Region, road, and year	Average number of freight cars on line: Home	Foreign	Total	Per cent unserviceable	Gross ton-miles per train-hour, excluding locomotives and tenders	Gross ton-miles per train-mile, excluding locomotives and tenders	Net ton-miles per train-mile	Net ton-miles per loaded car-mile	Net ton-miles per car-day	Car-miles per car-day	Net ton-miles per mile of road per day	Pounds of coal per 1,000 gross ton-miles, including locomotives and tenders	Locomotive-miles per locomotive-day
New England Region:													
Boston & Albany....1935	2,691	4,408	7,099	24.6	21,158	1,300	460	18.3	251	19.7	4,776	152	47.4
1934	2,993	3,466	6,459	25.9	21,612	1,281	427	17.3	258	22.0	4,153	158	43.2
Boston & Maine....1935	8,285	7,377	15,662	15.5	24,686	1,809	716	20.3	372	24.7	2,953	102	36.2
1934	10,009	5,890	15,899	22.8	25,492	1,830	690	20.2	349	25.0	2,750	101	34.9
N. Y., New Hav. & Hartf..1935	13,525	11,379	24,904	15.3	25,749	1,842	716	20.5	289	20.4	3,518	102	43.2
1934	16,319	9,664	25,983	13.2	24,127	1,688	643	20.4	252	18.3	3,190	106	36.9
Great Lakes Region:													
Delaware & Hudson....1935	10,293	2,818	13,111	4.9	28,870	2,123	1,031	28.9	515	25.9	8,083	105	35.9
1934	11,383	2,559	13,942	4.2	27,119	2,053	924	28.1	422	24.3	6,935	109	34.1
Del., Lack. & Western....1935	15,627	5,574	21,201	12.8	31,826	1,893	748	22.3	377	24.7	8,052	130	55.1
1934	16,496	4,266	20,762	12.3	27,920	1,825	704	21.9	369	25.1	7,716	146	53.2
Erie (incl. Chi. & Erie)...1935	20,995	12,876	33,871	6.0	43,999	2,596	960	22.3	617	41.6	9,068	89	51.6
1934	26,811	13,756	40,567	6.5	42,865	2,629	968	22.5	515	36.0	9,060	92	49.6
Grand Trunk Western....1935	5,669	7,092	12,761	18.0	30,814	1,675	625	22.4	322	22.3	4,082	94	48.3
1934	4,797	5,770	10,567	16.9	28,805	1,586	537	20.5	298	24.0	3,132	98	43.5
Lehigh Valley 1935	13,027	6,696	19,723	6.9	36,828	1,996	830	25.2	463	27.2	6,908	122	44.0
1934	17,900	4,956	22,856	13.3	31,838	1,816	715	24.2	374	24.2	6,400	132	43.5
New York Central....1935	121,395	65,794	187,189	19.6	35,422	2,166	914	26.6	369	22.3	6,333	98	55.4
1934	137,909	54,768	192,677	19.7	35,008	2,142	869	25.6	337	21.8	5,945	99	50.8
N. Y., Chi. & St. Louis....1935	7,890	7,659	15,549	5.6	36,571	2,066	783	22.1	676	46.0	6,332	85	75.4
1934	8,890	6,654	15,544	4.9	33,023	1,894	673	20.9	654	50.6	6,118	94	85.1
Pere Marquette 1935	9,702	6,408	16,110	4.4	26,625	1,651	665	25.6	448	28.0	3,456	88	75.3
1934	11,908	4,411	16,319	3.5	25,033	1,517	590	24.5	352	23.5	2,736	91	67.0
Pittsburgh & Lake Erie....1935	15,167	12,543	27,710	43.2	49,343	3,506	1,990	48.2	150	5.2	17,826	93	29.3
1934	16,063	9,275	25,338	48.4	49,990	3,464	1,872	47.6	152	5.9	16,476	91	28.9
Wabash 1935	11,840	8,737	20,577	2.9	36,123	1,822	651	20.3	533	39.3	4,502	104	54.7
1934	14,516	8,001	22,517	3.7	35,227	1,770	598	19.9	439	34.7	4,046	107	51.9
Central Eastern Region:													
Baltimore & Ohio....1935	71,394	22,758	94,152	20.0	27,269	2,087	947	30.3	429	22.1	6,397	137	44.8
1934	82,965	21,542	104,507	19.1	26,766	2,067	899	28.8	346	19.6	5,781	138	41.2
Central of New Jersey....1935	12,067	9,245	21,312	30.4	27,997	2,315	1,121	32.6	238	11.6	7,405	134	39.1
1934	15,706	6,831	22,537	34.2	27,323	2,295	1,073	32.0	202	10.7	6,584	131	33.1
Chicago & Eastern Illinois..1935	3,515	3,071	6,586	11.1	27,460	1,528	661	27.4	518	29.0	3,634	122	48.0
1934	4,088	2,397	6,485	12.8	25,914	1,460	606	26.1	496	30.1	3,423	117	49.6
Elgin, Joliet & Eastern....1935	7,620	3,554	11,174	6.5	17,756	1,910	952	37.6	233	9.9	5,991	106	32.2
1934	9,081	3,582	12,663	23.5	16,700	1,735	826	36.3	154	7.2	4,366	111	27.9
Long Island 1935	771	2,909	3,680	2.3	5,558	707	281	30.5	62	3.8	581	315	25.0
1934	766	3,104	3,870	2.5	6,133	837	332	29.4	74	4.7	726	276	23.2
Pennsylvania System 1935	233,092	55,812	288,904	16.5	33,330	2,400	1,079	29.0	300	15.9	8,670	114	41.3
1934	242,237	45,574	287,811	13.1	32,790	2,391	1,057	28.9	280	15.4	8,060	115	38.4
Reading 1935	28,513	8,794	37,307	10.1	26,567	2,106	1,011	33.9	308	14.4	7,912	135	37.6
1934	33,123	7,985	41,108	9.5	25,578	2,046	962	33.9	278	13.8	7,863	147	37.3
Pocahontas Region:													
Chesapeake & Ohio....1935	37,852	12,162	50,014	1.7	51,245	3,602	1,940	45.2	982	38.7	16,101	73	55.8
1934	43,527	11,498	55,025	2.1	52,714	3,794	2,035	45.8	991	39.5	17,735	70	53.3
Norfolk & Western....1935	31,084	4,744	35,828	3.1	47,611	3,191	1,652	41.2	860	34.6	14,360	101	53.7
1934	34,616	4,315	38,931	3.7	47,946	3,250	1,674	41.6	803	32.7	14,463	97	48.2
Southern Region:													
Atlantic Coast Line....1935	22,058	6,141	28,199	21.2	18,219	1,095	390	18.4	197	16.3	1,080	113	35.2
1934	26,643	4,414	31,057	23.4	17,281	1,050	365	18.0	170	14.7	1,028	116	32.1
Central of Georgia....1935	5,154	3,898	9,052	19.4	21,207	1,227	476	19.7	378	26.1	1,814	121	52.1
1934	6,771	2,030	8,801	28.7	21,291	1,211	462	20.2	349	24.7	1,630	121	48.2
Illinois Central (incl. Y. 1935	41,188	19,959	61,147	35.2	25,716	1,571	662	26.7	489	28.5	4,540	124	53.7
& M. V.)....1934	51,894	16,597	68,491	39.7	25,177	1,566	632	26.4	410	25.7	4,268	128	49.1
Louisville & Nashville....1935	36,471	8,250	44,721	31.2	25,454	1,646	797	33.5	551	27.1	4,884	121	59.2
1934	47,207	7,669	54,876	35.1	24,224	1,558	729	32.5	400	21.0	4,351	129	53.5
Seaboard Air Line....1935	9,687	4,964	14,651	3.7	21,352	1,316	509	20.8	430	29.4	1,467	116	44.8
1934	11,379	3,811	15,190	7.0	20,951	1,274	461	20.5	408	31.1	1,444	118	49.0
Southern 1935	24,646	16,443	41,089	15.2	21,136	1,269	497	20.6	429	29.5	2,673	142	45.1
1934	27,296	13,667	40,963	13.9	20,717	1,250	463	19.9	374	28.0	2,322	143	40.0
Northwestern Region:													
Chi. & North Western....1935	38,545	23,416	61,961	10.5	25,040	1,692	589	22.0	305	22.5	2,241	115	45.5
1934	42,974	21,090	64,064	13.8	24,558	1,594	531	20.5	291	24.0	2,211	122	46.9
Chicago Great Western....1935	1,862	4,145	6,007	2.3	35,896	1,948	738	23.0	941	63.9	3,876	119	83.4
1934	2,551	3,710	6,261	2.4	35,451	1,940	661	21.4	936	75.0	4,006	123	96.5
Chi., Milw., St. P. & Pac...1935	47,181	18,986	66,167	2.7	27,813	1,775	723	26.1	493	31.3	2,935	115	75.9
1934	56,644	17,023	73,667	5.9	25,476	1,627	620	23.6	386	27.3	2,549	117	57.3
Chi., St. P., Minneap. & Om.1935	2,857	7,527	10,384	9.6	19,752	1,428	621	27.0	427	24.5	2,703	108	56.0
1934	2,029	7,695	9,724	11.0	19,198	1,316	518	23.6	412	27.5	2,436	112	53.1
Great Northern 1935	38,666	17,402	56,068	5.4	36,953	2,545	1,120	31.1	657	36.7	4,471	101	57.3
1934	41,522	14,466	55,988	6.6	31,782	2,163	872	25.8	453	29.1	3,055	114	50.7
Minneap., St. P. & S. St. M..1935	13,314	5,387	18,701	4.1	22,859	1,457	664	27.0	436	23.9	1,907	93	82.0
1934	15,609	3,593	19,202	4.5	20,847	1,361	539	23.0	347	24.5	1,557	99	79.3
Northern Pacific 1935	30,597	7,939	38,536	11.4	30,772	2,033	848	26.3	550	33.4	3,299	136	66.4
1934	36,138	6,731	42,869	12.0	28,377	1,863	719	22.4	389	27.0	2,600	151	58.6
Oreg.-Wash. R. R. & Nav..1935	7,276	3,047	10,323	4.0	24,648	1,636	667	25.4	443	27.2	2,180	143	57.0
1934	7,796	2,390	10,186	6.4	23,383	1,486	572	22.4	341	23.2	1,615	152	53.7
Central Western Region:													
Alton 1935	2,406	6,855	9,261	21.3	33,363	1,435	537	23.3	366	24.5	3,684	111	73.1
1934	3,312	6,939	10,251	22.5	28,946	1,372	463	21.7	306	24.2	3,399	118	76.4
Atch., Top. & St. Fe (incl. 1935	70,105	11,369	81,474	11.7	32,085	1,739	590	21.0	394	29.6	2,418	113	61.5
G.C. & S.F. & P. & S.F.).1934	75,196	10,736	85,932	13.1	32,722	1,773	578	20.1	379	30.4	2,448	105	60.8
Chicago, Burl. & Quincy...1935	28,827	15,835	44,662	9.5	28,118	1,629	681	25.3	648	42.0	3,227	115	83.4
1934	33,568	14,791	48,359	8.4	27,173	1,567	609	23.5	561	41.1	2,993	119	84.9
Chi., Rock I. & Pac. (incl. 1935	27,364	12,287	39,651	13.6	23,342	1,360	541	23.5	444	28.8	2,120	130	52.2
Chi., Rock I. & Gulf)...1934	32,465	12,399	44,864	20.1	23,835	1,392	530	23.2	424	29.8	2,292	130	59.3
Denv. & Rio Gr. Western..1935	12,304	4,598	16,902	6.2	24,105	1,547	588	22.8	382	25.5	2,497	160	62.9
1934	12,565	5,036	17,601	5.3	23,186	1,509	569	22.3	370	26.2	2,469	168	62.1
Los Angeles & Salt Lake...1935	4,260	956	5,216	7.8	30,301	1,719	631	20.7	624	44.8	2,625	139	72.4
1934	4,702	998	5,700	11.6	30,456	1,731	657	22.5	633	44.3	2,951	137	77.8
Oregon Short Line....1935	8,193	4,162	12,355	20.2	24,879	1,597	577	21.9	655	47.2	3,244	123	87.1
1934	8,832	4,624	13,456	22.0	26,533	1,660	596	22.5	517	38.0	2,799	113	71.1
Southern Pac.—Pac. Lines.1935	34,452	26,853	61,305	8.6	31,390	2,009	701	22.0	465	33.4	3,317	103	62.4
1934	34,458	25,264	59,722	9.3	31,582	2,027	701	21.5	442	32.6	3,066	102	53.5
Union Pacific 1935	22,703	13,258	35,961	16.8	52,099	2,122	713	21.3	778	61.4	7,789	106	103.2
1934	23,101	10,280	33,381	19.5	47,340	2,016	647	20.0	770	65.9	6,823	108	100.7
Southwestern Region:													
Mo.-Kans.-Texas Lines 1935	5,373	4,974	10,347	3.0	29,907	1,688	643	22.7	737	49.8	2,322	80	62.0
1934	5,598	3,700	9,298	3.2	28,070	1,623	567	21.0	733	57.5	2,075	86	62.5
Missouri Pacific 1935	16,394	20,636	37,030	3.1	29,460	1,694	660	24.4	678	44.3	3,486	119	74.9
1934	20,795	20,675	41,470	4.4	29,587	1,694	637	23.5	606	42.6	3,429	120	75.1
St. Louis-San Francisco....1935	18,208	6,196	24,404	5.1	24,475	1,375	557	24.6	495	31.7	2,471	125	49.9
1934	21,861	5,259	27,120	7.3	23,067	1,334	505	23.0	415	29.8	2,230	133	49.3
St. Louis Southw. Lines...1935	3,020	2,551	5,571	6.2	23,587	1,373	557	21.9	656	40.7	2,067	100	60.2
1934	3,447	2,438	5,885	7.1	24,193	1,422	536	20.9	615	44.2	2,013	98	57.4
Texas & New Orleans....1935	7,151	10,836	17,987	8.9	23,222	1,358	517	22.4	443	29.7	1,803	91	54.0
1934	8,057	10,221	18,278	7.4	23,418	1,396	512	21.9	442	32.1	1,823	89	52.9
Texas & Pacific....1935	2,540	4,656	7,196	4.6	28,930	1,834	680	21.5	695	48.0	2,571	80	33.5
1934	3,356	4,516	7,872	5.9	27,359	1,857	690	21.2	676	46.9	2,733	88	33.8

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